



FRIDAY, SEPTEMBER 14, 1877.

The Kentucky River Bridge.

The engraving this week represents the northern span in its second stage of completion, or as it appeared just before it reached the permanent iron pier. Our description last week makes it unnecessary to say more about the method of erecting this bridge, but next week, when the remaining engravings will be published, we expect to give a fuller account of the work.

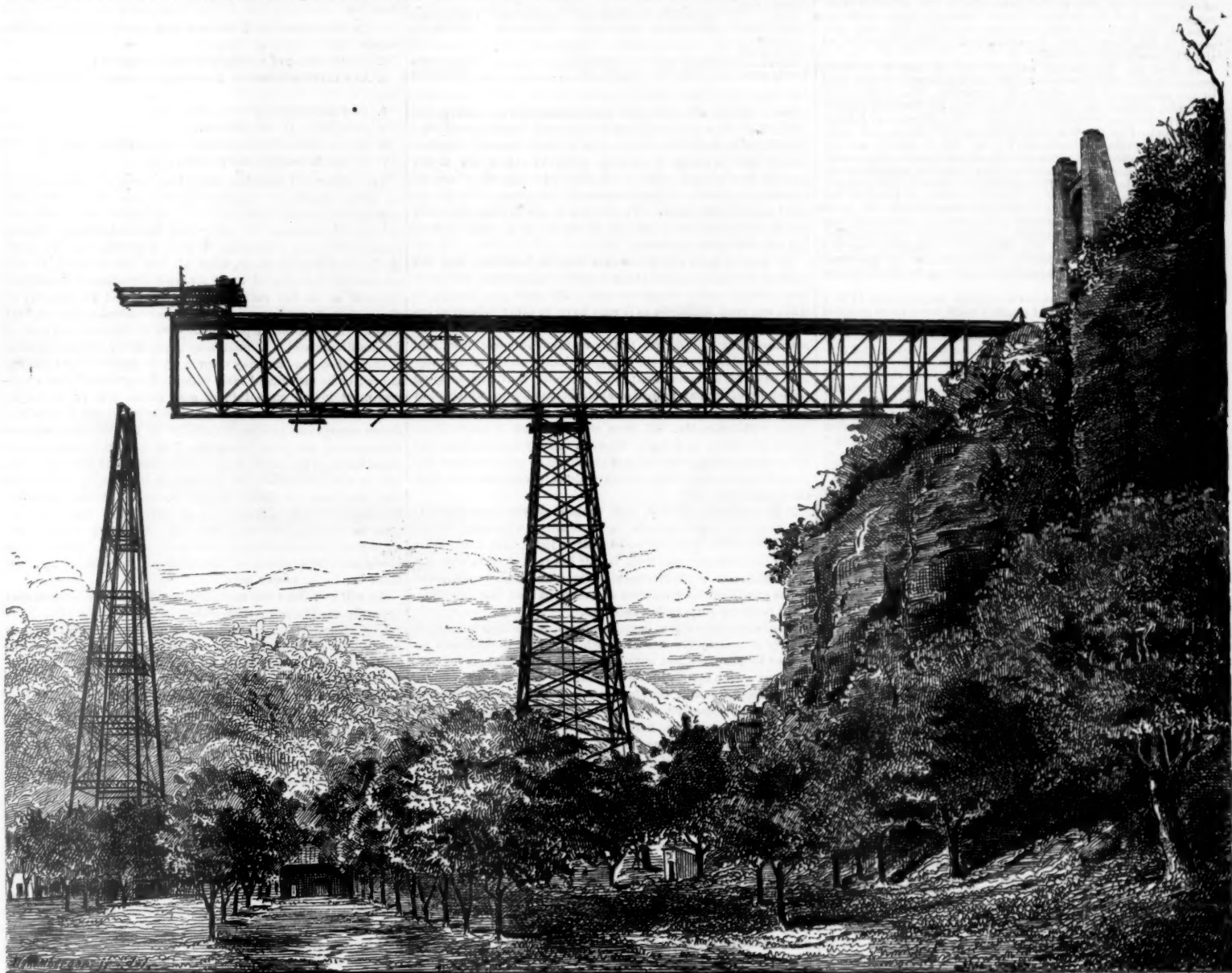
The Prevention of Railroad Strikes.

The following is part of a letter by Charles Francis Adams, Jr., published in the *Nation* of Sept. 6:  
President Scott, of the Pennsylvania Railroad, in an article in the last *North American Review*, takes the ground that the

should constitute their own benevolent and life assurance associations for the benefit of their employees. They should not leave this work to trade-unions; to do so, and thus invite outside influence, is neither sound policy nor good economy. . . . All occupations connected with running a railroad are hazardous. Both life and limb are in continual danger. Our railroad corporations are now old enough, large enough and rich enough to take this into consideration and systematically provide for it. . . . And these enormous corporations let trade-unions steal their men away from them! The thing seems hardly credible, and yet it is so. Plainly therefore, it is wholly their own fault if the officers of these corporations stand in terror of Mr. Arthur and his brotherhood. It is not legislation but wisdom that they need. They have no business to call for penal statutes or to look to the government for protection. Let them protect themselves."

In spite of the resolutions of the late Ohio Republican Convention, and notwithstanding the advocacy of a more direct and incessant Government intervention by men like Secretary Sherman and Senator Stanley Matthews on the one side and President Scott on the other, this seems to me to be not only sound common sense, but also sound American sense. It both places the responsibility where it belongs and demands a remedy from the one power competent to supply it. The French Government in practice most of all, and our Government in theory least of all, are given to interference with industrial details. Yet, curious enough, the thoroughly Ameri-

the end. The question of strikes in general, and the division of profits between labor, capital and intelligence, is one with which no sane man, who is neither a politician nor a sentimentalist, would now care to deal. Railroad strikes, however, are wholly different things. The corporations exposed to them are so large and wealthy, their business is so steady, their employees are so numerous, and their service is so regular that the problem presented is comparatively simple. They need only a system. Curiously enough, it happened that the State Railroad Commissioners of Massachusetts had intended on the very day upon which the recent strike broke out to issue a private invitation to the managers of the railroad companies having termini in Boston to meet them for the purpose of taking the whole subject into consideration. They were not satisfied with the position in which the Boston & Maine strike in February had left it. In view of the events which then followed, the meeting was postponed, but will probably soon be held. The object will be to see if some readjustment of the relations of railroad companies and their employees cannot be arrived at which will be mutually satisfactory, securing to one side permanence of employment and to the other security of service. Of course, in advance of such a meeting, which will be absolutely resultless unless the whole subject is freshly and thoroughly gone over, nothing has been proposed, much less matured. Nevertheless, the following general principles have been suggested, the consideration of which at this time by all those interested in the subject can do no harm:



ERECTION OF THE KENTUCKY RIVER BRIDGE:

Northern Span Just before Reaching Permanent Iron Pier.

railways of the country having become the great channels of inter-State commerce, it is the constitutional duty of the National Government to protect them in the performance of their functions. In this case the demand for government interference, with all that the name implies, comes from one representing the railroad corporations. As respects any general interference with the national mails it is apparent that the existing law is sufficient. The late strikers begin to realize that to their cost. So far as strikes by railroad employees in particular are concerned, it seems to me that President Scott is one of the very last persons in the country whose prayer for protection should be listened to by Congress or any one else. Let him protect himself. Others have done it; he and his company can do it in the same way. He can draw a lesson in this matter well worth his careful study from that Jacquin pamphlet to which I referred in my letter of a week ago. But I do not know that I can better preface a short description of the way in which the great French railroad company, which M. Jacquin speaks for, secures itself against trades-unionism and consequent strikes among its employees than by quoting the language used by the *Nation* in its issue of March 22 last. Col. Scott's *North American* paper gives to it even additional point. Speaking then of the demand for legislation bearing on railroad strikes, the *Nation* remarked:

"This is a question which ought to be settled by the railroad corporations and not by State legislatures. Indeed it never can be settled on a basis of penal legislation; it must be made a matter of kindly and friendly adjustment between the employers and employed. The proper course to pursue is also a very simple one, and one which we wonder some of our rich and powerful corporations have not already adopted. They

can doctrine I have just quoted from the *Nation* finds its strongest confirmation not in theory but in experience, and that also the experience of France. As respects interference in the details of railroad management, therefore, the Ohio politicians and their Pennsylvania Railroad ally have this time fairly tried to out-Herod Herod—to be more French than France."

It was President Vanderbilt, of the New York Central road, who uttered the one really significant word elicited by the strike, which has already been quoted, when he said, speaking of the employees of the Central, that they were "part of us." It is very much to be regretted that when he subsequently made a largess among them, in view of their good conduct during the recent crisis, he did not put it in a shape which would bear lasting fruit. The \$100,000 which he ordered to be divided among them will, as a mere gratuity, amount to nothing at all—hardly more than a shilling thrown to a tramp. It may make good the ten per cent. reduction in pay for a month or two. Had it been given, however, as the endowment of a New York Central provident or pension fund, the case would have been wholly different. It would then have been a magnificent gift, bearing permanent fruit in the creation of a lasting barrier against all future railroad strikes. The employees of the Central road would have been made to feel hereafter that a provision for their own future existed which it would be well for them and theirs not to sacrifice by any hasty action. Other companies would have followed the example thus set, and the great strike would not have been, as indeed it probably will not now be, without its compensating side.

The subject, however, is one of which we have not yet heard

1. The establishment of a service having all the elements of permanence, including apprenticeships, regular promotion, and, finally retiring pensions.

2. A gradual and reasonable increase of wages during active employment, based on the length of continuous service in any one grade.

3. The organization of a provident fund, to supply the place on fixed principles of that charity which is now doled out by all the companies in perpetually recurring hard cases, in amounts which vary according to the fluctuations of business or the good nature of superintendents. This fund to be endowed and guaranteed by the corporations interested in it, and to constitute a regular organized Railroad Employees' Mutual Life Assurance Company. The eight companies, for instance, which operate roads terminating in Boston represent a permanent investment of \$100,000,000, their annual net income is \$5,500,000, and they number 12,500 employees. If these companies would unite and organize their present charities and the contributions of their employees on some such basis as M. Jacquin describes, they would almost necessarily bring all trade-unions among those employees to a speedy end.

4. The practicability of having recourse to arbitration as a means of adjusting those differences of a general character which from time to time arise between corporations and their employees.

It certainly seems very desirable for the railroad corporations that those entrusted with their interests should devise some more practical and satisfactory solution for the difficulties that have lately confronted them than seems likely to be evolved out of mere Government meddling, or even the creation of a National Bureau of Industry. That solution, how-



ever, certainly will not come either from the politicians or their candidates, or even a large increase of the regular army. A better, a more thorough and charitable organization is necessary, and I know no surer way of arriving at it than through the study of what others not more favorably situated have already done in that direction.

#### Lubricating Flanges of the Leading Wheels of Locomotives.

In the last number of the *German Organ for Railroad Progress* is a communication on this subject from Chief Master of Machinery Mahla, of Munich, which we translate as follows: In Germany, it should be remembered, there is usually no truck under the locomotive, and the leading wheels are frequently (not always) driving-wheels.

The cutting of the flanges of the leading wheels of locomotives increases appreciably the cost of maintaining the engine, and on this account for some ten years search has been made for some method of reducing it. We refer here only to the frequently tried greater conicity of the tires of the leading wheels, which, however, is attended with certain disadvantages, and cannot be applied to engines whose leading wheels are coupled with the drivers.

Recently attention has been directed to the simple method of lubricating the tires at the place where the greatest wear takes place, and the Bavarian State railroads have made extensive experiments in this direction, according to a plan proposed by Mr. Fischer von Roesslerstamm, Chief Inspector of the Empress Elizabeth road.

At first the lubrication was effected by means of solid grease tablets, which were set and guided in sockets attached to the springs of the wheels in question. The sockets are movable, so that the tablets in them can be directed exactly upon the friction surface of the tire. The first grease tablets were supplied by the firm of L. Artmann, of Vienna, and made of three degrees of hardness, one for use in winter, one for moderate temperature, and one for midsummer; afterwards, however, the supply was furnished by a domestic manufacturer, the material being of similar quality but considerably cheaper in price. Finally, in order to reduce as much as possible the cost of the lubrication, and to simplify the process, felt cases with thin boards and saturated with rape or vulcan oil, was substituted for the grease tablets, and with the most satisfactory results. The felt has this advantage especially over the hard grease, that the lubrication is independent of the temperature of the atmosphere, and therefore can be effected more uniformly.

The experiments were made on express engines with 14 ft. 1 in. wheel base and on freight engines with three axles coupled and 11 ft. 4 in. wheel-base. The comparisons were always made with such engines of similar construction, provided with tires of the same make and ordered at the same time, and performing similar service. Although in spite of this quite considerable differences, due to unequal hardness in the tires and inexactness in the fitting of the engines (the flanges running towards one side), were apparent, still in general there was so considerable a reduction of the wear of the lubricated flanges, compared with those not lubricated, that the cost of lubrication could hardly be considered in comparison with it. It can now properly be affirmed that with a rational lubrication the life of a leading wheel with a lubricated flange relative to that of one not lubricated is at least as 3 to 2, which illustrates the great value of the lubrication. Moreover, on engines with lubricated flanges the unpleasant noise of the friction between wheel and rail while running around sharp curves disappears, and the running there is gentler and easier.

Evidently the wear of the rail head on the outer line of rails or curves is reduced by the lubrication in the same proportion as the wear of the flanges, and so there accrues an advantage not to be despised in connection with the maintenance of road. Hitherto lubrication has been applied only in dry weather, and in time of rain it appears less necessary, as then the rain water serves as a lubricant. In snow storms the lubrication has to be interrupted, since the snow remains partly hanging to the tires, and pushes the lubricating tablets back from the surface of contact, and finally into the sockets. However, in this case also the lubrication is only of subordinate importance, since the snow then fulfills in part the object aimed at.

So far as concerns attendance to the lubricating apparatus, it is the simplest imaginable, and causes the engineman little trouble and labor; he is at most for pouring on a few drops of oil at the chief stations, so that in this connection no objection can be made to the introduction of lubrication. Also, the fear that the upper face of the rails or the running surface of the wheels would become greasy, and thus the adhesion of the driving-wheels be reduced, has been shown to be groundless. No case has been known where the driving-wheels slipped in consequence of the lubrication.

The cost of the lubrication, as it has been done hitherto, amounted on the average to four to six cents per 100 miles run when hard grease was used, and at 1.3 to 2.0 cents per 100 miles run when felt saturated with oil was used. In the latter case, assuming that an engine runs 25,000 miles, the expense per year would be \$3 to \$5—an amount which almost disappears in comparison with the advantage attained.

### Contributions.

#### Some Thoughts on the Executive and Financial Management of Railways, and the True Cause of their Anomalies.

TO THE EDITOR OF THE RAILROAD GAZETTE:

It is the purpose of the writer in a series of two or three articles to suggest some views on which he has long meditated as to the true cause of the various anomalies and difficulties arising in the management of railways. He has been surprised to note that these views do not seem to have occurred to the commentators on, or sufferers from, the various outward symptoms of some inward defect in the organization of railways, and he hastens to admit that this fact raises a strong presumption against the soundness of those views. But, after making all allowances on that account, he believes they will merit the attention of those who are interested in the prosperity of railways.

Before entering on the subject, however, it is necessary to bring up vividly before the mind of the reader the essential fact that the railway system is, after all, a thing of yesterday. Within the memory of men still young—at so recent a date as 1850—the railway was but little more than a luxury and an experiment. What it is to-day—as well as what it was then—is shown in the table following. It is needless to say that the industrial history of the world presents no parallel to so rapid a development.

This being the case, the presumption is very strong indeed that many minor defects of the system would remain uncorrected; and there is abundant room for the presumption that some vital and grave abuse may have crept into the theory of

the system in its childhood and grown with its growth. It is a mere truism to say that there are all the outward evidences of some such defect; the mutual dislike and suspicion which are so plainly evident in the relations of railway patrons, proprietors, managers and employees must be conclusive as to this fact with every one. And when we further consider that there was and is none such visible toward other methods of transportation, and little, if any, visible in the overwhelmingly

TABLE SHOWING THE PROGRESS OF THE EXTENSION OF RAILWAYS.

Year.	MILES IN USE.			
	In North America.	In Europe.	In other parts of the world.	Total.
1876.....	83,087	93,415	18,354	194,856
1866.....	38,500	49,800	6,530	94,830
1850.....	9,326	14,333	.....	23,659
1840.....	2,949	1,718	.....	4,667

INVESTED CAPITAL, INCOME AND EXPENDITURES.

(Rude approximations only, except for North America in 1876.)

1876.				
Capital.....	\$5,000,000,000	\$8,000,000,000	\$1,500,000,000	\$14,500,000,000
Yearly earnings.....	520,000,000	1,000,000,000	100,000,000	1,620,000,000
Yearly exps.....	510,000,000	550,000,000	70,000,000	930,000,000
1850.				
Yearly earnings.....	40,000,000	80,000,000	.....	120,000,000
Yearly exps.....	28,000,000	45,000,000	.....	73,000,000

greater volume of commercial and manufacturing enterprises—which yet bear many analogies to railway management—the conclusion becomes irresistible that all these various disorders cannot each be assigned to some different cause, nor to any natural and proper cause whatever, but that they are all nothing more than dissimilar outward symptoms of some inward and organic defect. The writer hopes to show that they are in fact all due, in great part or whole, to a single irritating and unconsidered abuse.

He must at once admit another truism, however, that the railway system is in very many respects anomalous and peculiar to itself; and it seems necessary, for that very reason, to trace out such analogies as it may have to other industrial enterprises which have reached their development through the attrition of ages. Of two things we may be sure; first, that such enterprises are, in the main, conducted on the most profitable basis for all concerned; and, secondly, that any seeming principle of human nature or abstract justice to which they have conformed themselves cannot be changed by railways nor defied with impunity. If, then, we shall find a single functional difference, as it were, between railway management and other enterprises, with varying evidences of irritation and discontent in the case of the railways alone, there is but one logical conclusion.

It may be well to state, also, the self-evident postulate that a railway corporation stands, in its dealings with men, as well as in law, precisely in the position of an individual. Whatever is fair between man and man is fair between corporation and man; whatever is not fair between man and man, or whatever is not expedient between man and man, is not fair nor expedient between corporation and man.

A railway corporation, in its inception, is nothing more than a body of speculative capitalists who combine their means together to purchase and improve a vast landed property, precisely as a man buys a lot on speculation and puts up a house on it, except for this, that by the very act of such construction they become possessed of a certain monopoly, of a more or less uncertain value and held by a more or less uncertain tenure. It is this hazardous element which gives the chief value to their property, and it is plain that no system would be just which did not give them the exclusive right to the profits arising from their initiatory sagacity, as much as if they had speculated in the Keeley motor.

When the line is completed, the corporation turns it over to a certain body of employees—president, manager, superintendent, master mechanic, or whoever they may be *de facto*, but all of them presumably trained and able men—with instructions to organize and carry on a complicated manufacturing establishment, for the manufacture of a novel article of human consumption—TRANSPORTATION. This fact must be clearly recognized, that transportation is itself a manufacture, as much as a locomotive, and as such strictly analogous to other manufacturing enterprises. It is very true that it cannot be weighed and measured and stored away like other manufactures; it is an imponderable abstraction; but nevertheless it is an actual article of human production and bargain and sale, and it must be made before it can be consumed. Moreover, it is a wholly new manufacture. Doubtless transportation of some kind or other has existed, from the beginning of the world; but so has the art of clothing the human body. Nevertheless, the prehistoric dressing of skins bears no real analogy to the modern cotton mill, other than the accidental fact that its productions were used for the same purpose. Practically the railway has created and supplies a new article of human need: It is the first to manufacture transportation on a vast scale and by modern contrivances. Its establishments for this purpose must be scattered over a wide extent of territory and yet must be under one general management—two facts which help to make it one of the most exacting departments of modern manufacturing enterprise. The machine tools which it uses in the process of manufacture are (1) the track (which in no proper sense is a fixture, but as much a perishable tool as a lathe or loom); (2) locomotives; (3) cars, carriages, wagons, or whatever they may be termed.

Another fact distinguishes the manufacture of transportation from analogous enterprises. The exigencies of the process are so great and the wear of its machine tools so rapid that it must maintain, in addition to its general manufacturing establishment, three separate and extensive establishments for the manufacture and repair of its machine tools; known as the road department, the machinery department, and the car de-

partment. Many other manufacturing establishments make some small repairs on their tools, but there is none other of any importance which continuously repairs and renews its entire plant.

These various establishments having been got into condition to turn out a marketable article, the corporation becomes in its own proper person (so far as the directors represent it) to some small extent a *jobber in transportation*. At least, it exercises some direct supervision over certain large sales and contracts. Only a small portion of its goods, however, are thus disposed of. The great bulk of them is turned over to another body of employees—President, General Freight or Ticket Agent, Secretary or Treasurer, or whoever they may be *de facto*, but all of them presumably trained and able men—with instructions to sell off its commodities at retail to Tom, Dick and Harry in lots to suit, at the highest price to be obtained from them, all and singular. A part of these sales is for "prices marked in plain figures," but a very large proportion is consummated with an amount of dicker unparalleled in the business world outside of Chatham street.

Summing up the above, a railway company in full operation is acting:

1. As the owner of a certain real-estate and its improvements;
2. As the owner of a certain vested monopoly;
3. As a manufacturer of a certain commodity—transportation;
4. As a manufacturer of machine-tools;
5. As a jobber in transportation;
6. As a retailer of transportation; including necessarily
7. As warehouseman and storekeeper.

The reader will doubtless admit that these analogies are in no sense fanciful or variable distinctions which might be changed at pleasure, but that they all mark exact and permanent resemblances to other and long-established departments of business enterprise. If so, it is evident that the peculiarity of railway business, after all, lies not so much in the anomalous character of each separate department considered by itself as in the enormous complexity and dissimilarity of the various departments and sub-departments, and in the fact that all these various departments *must* be founded and carried on simultaneously. A man may make shoes without opening a shoe shop, or he may open a shoe shop without making shoes; or he may make lasts without doing either; but a railway must do all such things, and more, too, or it can do nothing. Nevertheless, if a man chooses to go into half-a-dozen enterprises at once his affairs do not therefore become phenomenal, nor is he less obliged to conform each separate department of his business to business laws and customs. Just so it is with railways. The anomaly in the case of railways is that they have no choice in the matter: several dissimilar transactions *must* be carried on at once. But that does not make the railway system a law unto itself, nor weaken the argument which the writer desires to enforce, that it must model each department on the business customs of ages, or there can be no health in it.

We will now draw one more analogy, which is so evident that it hardly need be more than stated.

Every corporation, as such, in conducting its affairs stands precisely in the position of a speculative individual totally unskilled in and contributing no personal services to a business in which he has embarked his capital.

This is necessarily the case, because the theory of the corporation is that it is a mere agglomeration of capital, in the profits of which every man shares in proportion to his money invested and to that alone. Individual contributors may, or may not, be more or less skilled, but in such cases their skill is recognized by a salaried or honorary position, if at all, and does not become an integral part of the corporation. Their ability is hired; their money alone is taken into partnership. Furthermore, it is plainly impossible for a corporation, as such, to contribute active supervision to the conduct of its affairs. It is a mere abstract entity, without form or substance, and all such services must be hired or gratuitous.

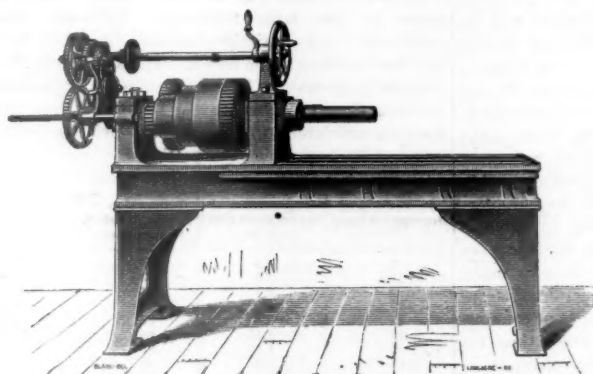
In the case of all other than railway corporations, this distinction is largely nominal, for such are usually small affairs, with a majority of the stock and all the executive positions held by men trained to its business from childhood. Such men must serve the corporation to serve themselves, and practically they are the corporation. But in the case of railways the distinction is not only true in theory but in actual fact. Not one-fiftieth part of the stock of American railways is owned by men trained to the management of any department of the business, or competent to conduct it.

Now we are prepared to consider how these unskilled individuals are conducting their affairs. In half-a-dozen ways, upon which we cannot stop to comment, railways are violating business customs; but the reader who has glanced on the above enumeration of their functions can hardly have failed to detect the writer's position, that the root of all railway troubles lies in this notable and remarkable fact: the entire administration and management of every department of a railway, from beginning to end, from top to bottom, in general and in detail, is in the hands of salaried men. From the highest *de facto* manager down to the lowest laborer there is not a single man, serving any railway in any capacity who has an appreciable personal interest in the value of his own services, or in the honesty and efficiency of his inferiors or in the honesty and efficiency of his superiors; nor whose tenure of office is—in any proper sense—dependent upon those who have such interest. The corporation acts upon the theory that it can hire men for a fixed stipend to carry on every department of its business, and it recognizes no difference in kind, but only in degree, between the services of the general manager and the services of the brakeman.

Now if the reader who has never before reflected upon this fact will turn it over in his mind on every side and search his memory for any other instance in the affairs of men where the



system is pursued, under fairly analogous conditions, he can hardly fail to be startled at the audacity of the innovation which the railway system is attempting on the recognized rules and customs of the business world. The writer feels that he has but inadequately stated his case. He should have proved in advance, as he proposes to do before closing, that the seeming exceptions which may serve to keep the railways in countenance are not exceptional either in the case of other corporations employing salaried men or of other salaried men not employed by corporations. He should also have proved in advance, as he proposes to do before closing, that such a system is essentially immoral and unjust, and never ought to work well. But the subject is so great and his ability so little that he could not do so without a tedious preamble. He therefore passes over those questions entirely, and proposes to show first, in a strictly practical way, the unbusinesslike folly of any such attempt, and, secondly, to show how railways may, almost by a turn of the wrist, relieve themselves from their preposterous position. In order to appreciate the folly of such an attempt in all its length and breadth and depth, there is nothing like a parallel case from business life. Let the reader suppose, then, that he were acquainted with a raw youth who had become possessed of a profitable and indispensable monopoly—say the sewing-machine business—and an extensive series of factories and commercial establishments for manufacturing and selling his goods; who gave no personal attention to his business and knew nothing about it, but carried it on entirely with salaried employees under a “general manager,” and who was in a state of general dissatisfaction that his “general balance sheet” showed very little profit or none at all. That raw youth is in law and in fact analogous to any railway corporation; and what would any business men expect to be the condition of such a concern? Would he not expect to find some men dishonest, others lazy, others domineering, and all suspicious of the rest, half-hearted, and more or less inefficient? Would he not expect that every faithful employee would have a constant struggle with the temptations of the flesh and the contamination of his surroundings? Would he be surprised to find the machinery of antique pattern and slow to change, the salesmen surly, the hands paid a little more than others and a little less contented with their wages? Would there not be a leak here, and a leak there, and extravagance everywhere, except by some miracle?



HORIZONTAL BORING MACHINE FOR CAR JOURNAL BEARINGS, ETC.

By Wm. Sellers & Co., Philadelphia.

Now if any business man were giving advice to such a youth would he not most certainly say something like this: “You are conducting your business on wrong principles throughout. Your general manager is not capable of supervising such a variety of affairs, unless he is a phenomenal man. You must sub-divide your business into departments, and put some one in supreme authority over each, making it for his interest to serve you well, with corresponding penalties for all deficiencies. As to your manufacturing department, it is an absolute certainty that your goods cost you more than they ought—and always will. Find some skilled manufacturer—in your employ or out of it—and put him in supreme authority over that department on a partnership interest, under penalty to turn out goods as ordered. If your goods have no market price, fix a price—any price—what they are costing you now, or as much less as any one will accept as leaving a fair manufacturer’s profit.”

“Then your sales department is probably in worse condition than the other. You cannot hire men to carry on a great retail business effectively—nor wholesale either. Nobody ever does it. Take some skilled business man into partnership to manage that whole department, turning the goods over to him at certain fixed rates—as high as they will bear—with all expenses payable out of retail profits. Pay him, if you like, a small commission on any sales above cost, but leave his chance for paying expenses and profits to come out of high rates.”

Now all this would be plainly business-like and sound, and it applies without the change of a word to railways. Their two great departments are totally distinct from each other, and each of them requires vigilant sagacity and level-headedness of the highest grade for its most profitable management. Men rendering such services cannot be properly compensated by a salary, for they are not simply in positions of trust to handle other people’s money; they literally make money by the exercise of their skill; and the value of such services is strictly dependent upon the “personal equation.” It cannot be estimated in advance, even for the same man from year to year. Therefore it is evident that any fixed stipend for such services may be over-pay or under-pay, but never can be fair pay. And as anything which is not fair on both sides and at all times is in the long run disadvantageous to all concerned, the business world has long since admitted that it is to the last degree fool-

ish to ask or expect men’s utmost service in such capacities for any other compensation than a heavy partnership interest, express or implied, in the value of their own services. Is it not true that, unless all human experience is to go for naught, our railways must recognize the same principle, if they would reap the same benefits? If we may believe in the principle of “evolution” the highest grades of the ability which they require will not even be in existence until they have done so.

This reasoning, as the writer claims, is fully applicable to both of the two great executive departments of a railway, but coming in between those two departments, it will be observed, there is a great middle transaction, a mere process of transfer, for which nothing more is required than that ordinary human sagacity which teaches us to buy at the lowest price possible and sell at the highest price possible. Here is the railway corporation’s legitimate opportunity for enormous speculative profits in its capacity as capitalist alone, without sharing with any one. This opportunity is justly due as a compensation for its initiatory sagacity, and no man has a right to share in it; and it seems probable to the writer that the partnership principle would have been recognized long since on railways except for the natural unwillingness of corporations to give away any part of the profit on this transaction—at once the greatest and the simplest in railway finance—combined with the gratuitous assumption that railway business is a single, complex, anomalous enterprise—instead of half-a-dozen unequally yoked-together—and must be conducted as a unit under one general management. But the latter assumption, as the writer claims, is so superficial that it is astounding it should have prevailed so long. It begs the question grossly. There is, admittedly, such a necessity under all artificial systems, which defy or neglect the dominant impulses of mankind in their organization or purposes; of such systems the military organization must always be the great prototype and model; but there is no such necessity in any industrial enterprise where the desire of men to better their own condition in life can be substituted for authority. What commissariat department, for example, ever worked so perfectly as that which sup-

plies a great city; bringing in every day just enough of everything for every one, and none to waste? Custom has dulled us to its wonderful character, but it is one of the marvels of modern life. Yet these men do not even know themselves to be but parts of one stupendous whole. Each in his degree is simply anxious to butter his own parsnips; and the great end is accomplished without half the cost and with ten times the efficiency of the most perfect system which the brain of man could organize. Let one man try to hire all these men, for their average income—or two or three times that—to accomplish the same end, and what would come of it? Waste, dissatisfaction, strikes, dissension, peculation, inefficiency—an exaggeration of the vices of the railway system. To say that the two cases are not analogous begs the question again. The writer asserts that they are precisely analogous, except that the railway problem is very much simpler, and he purposes, in the following paper, to sketch out a plan by which any railway may conduct its affairs in accordance with sound business principles to-morrow, by the mere execution of a few papers.

ARTHUR M. WELLINGTON.

#### A Card.

To the voting members of the American Society of Civil Engineers:

Your attention is respectfully invited to two facts, viz.:

1. The committee which submitted at the Ninth Annual Convention at New Orleans the draft of a memorial relative to metric weights and measures was appointed under the following resolution:

“Resolved, That the American Society of Civil Engineers will further, by all legitimate means, the adoption of the metric standards in the Office of Weights and Measures at Washington, as the sole authorized standards of weights and measures in the United States; that the Chair appoint a committee of five to report to the Society a form of memorial to Congress, in furtherance of the object expressed; and that the foregoing be submitted to the Society and voted on by letter ballot.”

So far as the chairman can judge, he fully believes that the members of the committee were unanimous in the opinion that it was their duty to report a form of memorial suitable for presentation to Congress; a memorial whose adoption by the American Society of Civil Engineers would further the adoption of the metric system as sole standard in the United States;

and that all means proposed to be employed by the Society must be legitimate.

2. The United States standard weights and measures are preserved in the United States Coast Survey Office, Bureau or Office of Weights and Measures, in charge of J. E. Hilgard. In a letter of Nov. 19, 1875, Prof. Hilgard writes: “About the functions of the Office of Weights and Measures in Washington, I write next week;” and in a letter of Nov. 21, 1875: “The United States Office of Weights and Measures owes its existence to the fact,” etc., and “This Bureau or Office is thus a branch of the Treasury Department and part of the Coast Survey Office.”

[Signed] CLEMENS HIRSCHMANN,  
Member Am. Soc. Civ. Eng’rs.

Boston, Sept. 7, 1877.

#### How Was It Done?

CHENEYVILLE, La., Sept. 2, 1877.

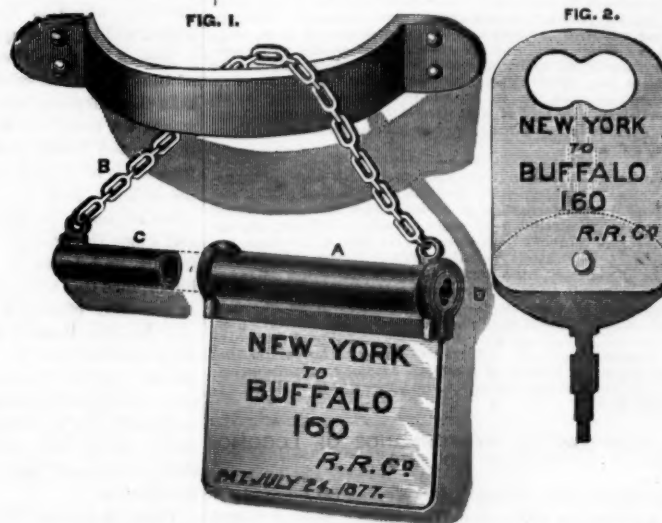
TO THE EDITOR OF THE RAILROAD GAZETTE:

Mr. Rowland, of the Philadelphia & Atlantic City Railway, is correct in supposing that “the methods of construction,” “original with the officers of the road, are of considerable interest to the profession.”

The undersigned member of the profession would be glad to know how 23,000 cubic yards of embankment, 1,800 feet long, were put up in one week at an average cost of 10 cents per yard; also, how five miles of track, over which trains of 29 cars make 30 miles per hour, were laid in one day. SLOW COACH.

#### Locking Baggage Check.

The principal object aimed at in using baggage checks is, first, to designate any article of baggage delivered to a railroad company or other party, and, second, by giving a duplicate of the check attached to the baggage to the possessor to supply him with a certificate of ownership or receipt by which he can establish his claim to it. Checks also serve to indicate the destination of the articles to which they are attached, but this use is only secondary. As checks are usually attached to



DERAISMES’ LOCKING BAGGAGE CHECK.

baggage simply by a strap, it is of course comparatively easy for any person to remove them and replace them with other checks. This has frequently been done, and by checking baggage which is comparatively valueless, and then removing the check from a trunk or other package and putting the first in its place, the destination of the two is changed, and by this means a dishonest person may get possession of valuable baggage belonging to some one else.

The object of the locking baggage check is to make it more difficult if not impossible to exchange checks in this way. It consists of a check which is attached to baggage by a hardened steel chain, and fastened by a spring lock, A. To the duplicate check, fig. 2, is attached a key which must be used to remove the first check attached to the baggage. The check can be fastened by simply inserting the part C into the lock, but to remove it the key, fig. 1, must be used. This key is delivered to the owner of the trunk or other article with his check, and the one attached to the baggage cannot be removed without the use of the duplicate check and the key attached thereto unless violence be used. In this way it furnishes a safeguard against the exchange of checks and prevents baggage from getting into the possession of those to whom it does not belong. The inventor is Mr. H. A. Deraismes, whose address is No. 182 Broadway, New York.

#### Boring Machine for Car Journal Bearings.

As the subject of hot boxes, lubrication, etc., has been discussed a good deal recently, the illustration of the machine constructed by Messrs. William Sellers & Co., of Philadelphia, for the purpose of boring car journal bearings, will be of interest to many of our readers.

The machine is shown in the engraving without the arrangements for holding the work to be done, but the prolongation of the bed or shears beyond the boring head is provided with slots for bolts to enable devices for holding special work to be readily bolted to place. It is used not only for boring all kinds of car journal bearings, but for such purposes as boring Westinghouse brake cylinders, hangers, hanger-boxes and couplings for shafting.

For this machine the manufacturers have adapted their new arrangement to accomplish coarse feeds for finishing cuts, so that its operation is very rapid, but at the same time the work is done with the utmost accuracy.





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## Editorial Announcements.

**Passes.**—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

**Addresses.**—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

**Advertisements.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns our own opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

**Contributions.**—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

## THE EVAPORATIVE PERFORMANCE OF LOCOMOTIVE BOILERS.

In D. K. Clark's "Manual for Mechanical Engineers," a review of which will be found on another page, it is said "that practically there can never be too much heating surface, as regards economical evaporation, but there may be too little; and that, on the contrary, there may be too much grate-area for economical evaporation, but there cannot be too little, so long as the required rate of combustion per square foot does not exceed the limits imposed by physical conditions." At first it seems as though this statement could not be true, but a little consideration will, it is thought, show its reasonableness. Let us suppose that we have a locomotive with a train whose weight is equal to the maximum load which can be drawn with the amount of adhesion due to the weight on the driving-wheels. It is obvious that in such a case a sufficient amount of fuel must be burned in the fire-box to generate enough steam to supply the cylinders and to draw the load. Now supposing that in order to do this it is necessary, on the most difficult part of the line, to burn 36 lbs. of coal per minute to keep up steam, and also that with the appliances and the fuel used the maximum rate of combustion is 3 lbs. per square foot of grate per minute, then it is evident that the minimum size of grate which can be used in such a case is  $\frac{36}{3} = 12$  square feet. In other words, "the limit of the rate of combustion imposed by physical conditions" make it necessary to use a grate of that size. Supposing, however, that instead of using a grate with 12 square feet, it is made of such a size that it has 18 square feet of area. In that case it would be necessary to burn only two pounds per square foot per minute in order to make steam. But the larger the amount of fuel that can be burned within a given space the higher will be the temperature produced by the combustion, as is shown by a common blow-pipe, a blacksmith's forge or an iron-smelting furnace. The reason for this is that the heat developed by combustion dissipates itself more rapidly than it is generated, unless the rate of combustion is very rapid. The temperature of the products of combustion of average coal, if just enough air is supplied for perfect combustion, is at the instant it is complete about 4,640° F. Such high temperatures are dissipated with inconceivable rapidity, by radiation and other means, when combustion takes place in a space like

a fire-box and surrounded by the comparatively cold sides. Combustion is in reality a process consisting of an infinite number of small explosions, caused by the combination of the molecules of the combustible and the oxygen or supporter of combustion, but separated by some sensible or conceivable intervals of time. This is shown by the fact that if we mix oxygen with say carburetted hydrogen and light it, it will explode, showing that the chemical combination of the molecules of the gas with the oxygen is attended with much violence and danger, if sufficiently great quantities are mixed together so that they can all combine instantly. In ordinary combustion the process is not instantaneous, but consists, as stated, of an aggregation of small explosions, probably of separate molecules. Now if a small number of these explosions take place at the high temperatures of combustion, as has already been stated, the heat is dissipated more rapidly than it is generated, so that the temperature of the fire is comparatively very low; but in the case of a blow-pipe, by employing a concentrated current of air which is brought in contact with the gas, thus causing a much larger number of the small explosions at a given point, a much higher temperature can be maintained without being diffused. It should be remembered that ordinarily the temperature, as it would be indicated by a thermometer or other instrument if it were placed in a fire, is very much less than that of the molecules of oxygen and carbon or hydrogen at the instant that they combine with each other, and the only way to produce or rather maintain high temperatures is to cause these combinations or explosions to follow each other with greater rapidity. This can be done by means of a blast, and the weight of fuel which can be burned in a given time in a given furnace depends on the draught. The larger the quantity of fuel, therefore, which is burned in a given area of grate the higher will be the temperature of the fire.

Now it is a well-recognized law that the transmission of heat from a hot substance to a colder one is greater than the difference between their temperatures. In other words, the heat from the products of combustion will be transmitted to the water in the boiler much more rapidly from a fire of a high temperature than from one which is not so hot. Now in a locomotive boiler, where the fire must at times be urged to the utmost practicable limit, and where the products of combustion pass through the furnace and tubes so very rapidly, it is of very great importance that the heat should be transmitted as quickly as possible, otherwise it will escape up the chimney, and for this reason it is more important to produce high temperatures in locomotive than in stationary or marine boilers, because in these latter there is much more heating surface in proportion to the amount of steam generated, and the movement of the products of combustion is slower and consequently there is more time for them to transmit their heat to the boiler than there is in locomotives.

There is also another advantage in favor of rapid combustion, growing out of the fact that when a forced draught is employed the quantity of air necessary to supply to the fire in order to effect the most perfect combustion practicable is much less than that required when the draught is less violent. Ordinarily in stationary boilers the best results can be produced by supplying about twice as much air to the fire as is required theoretically for complete combustion. Although the subject has never been very thoroughly investigated, it is probable that the quantity of air may be diminished in some proportion to the degree to which the draught is increased and combustion concentrated on the grate. It is evident that if a larger amount of air is supplied to the fire than is needed, not only will the temperature of the products of combustion be lowered by the superfluous air, but their volume will also be increased thereby, and consequently, in order to get a given quantity through the tubes in a given time, their velocity must be in proportion to their volume, and therefore not only will their temperatures be lower and the transmission of heat on that account less rapid, but they will also, owing to their high velocity, be in contact with the heating surfaces for less time.

It is evident from these considerations, that a rapid rate, or intensity, of combustion which will produce high temperature has, in locomotive boilers, great advantages over slower combustion and consequent lower temperatures. As the combustion will be intense in proportion to the quantity of fuel consumed on the grate per square foot of area in a given time, it follows that, as Mr. Clark states it, "there cannot be too little grate area, so long as the required rate of combustion per square foot does not exceed the limits imposed by physical conditions."

After the process of combustion is complete, however, the question then arises, what is the best disposition which can be made of the products of combustion. The high rate at which combustion is carried on in a locomotive should always be kept in mind, and also that in the process of transmitting heat to the water in the boiler time is an important element, and that it is of the utmost im-

portance that the products of combustion should be in contact with the heating surfaces as long as possible. Reference has frequently been made to the fact that experiments have shown that much the largest proportion of the steam generated by the tubes in a locomotive boiler is produced at the end next the fire-box. In experiments made on the Northern Railroad of France it was shown that the three feet in length of tubes next the smoke-box evaporated only about 4 per cent. of the water which was converted into steam. Now, it is sometimes argued from this that this portion of the tubes is almost useless. If, however, they had been made three feet shorter it is evident that the 4 per cent. of heat absorbed by the last three feet of their length would have gone up the chimney and been wasted. In other words, the last three feet in length effected a saving in heat of 4 per cent., and to argue that because the last end of the tubes is less efficient in generating steam than the first end, therefore it is comparatively useless, seems just as unreasonable as it would be for a farmer to decline to use a rake in his harvest field because the latter gathered so much less grain than a reaping machine. Any heat which can be absorbed by the tubes and thus prevented from going up the chimney is that much clear saved. It is obvious then that the longer the products of combustion can remain in contact with the heating surface, the more heat will be absorbed and thus prevented from escaping, and it is also evident that the greater the amount of heating surface the longer the products of combustion may be in contact with it, or, as stated by Mr. Clark, "practically there can never be too much heating surface as regards economical evaporation."

In his "Railway Machinery" (a book, by the way, which is not studied nearly as much by master mechanics as its merits deserve), Mr. Clark gives the results of experiments to show the effects on the amount of water evaporated per pound of coal of different proportions of heating surface to grate area. Some of the results of these experiments which can be most easily compared are given in the table following. Although the results are not entirely regular, it will be seen that the tendency of the rate of evaporation is to increase with the proportion of heating surface to grate area. It was from these experiments that Mr. Clark drew his deductions which form the basis of the principle which is stated at the beginning of this article:

Proportion of heating surface to grate area.	Evaporation of water per lb. of coal, lbs.	Proportion of heating surface to grate area.	Evaporation of water per lb. of coal, lbs.
6	3.4	55	6.65
11.4	4.5	73	7.19
23	5.3	74	6.85
27.6	5.37	78	8.28
41	6.87	83	8.17
42	4.17	84	7.67
43.3	5.52	86	8.06
48	6.8	90	8.75
50	5.2	94	8.8
52	7		

One exception to this principle must, however, be made. If the tubes are placed too near together, it was found by Mr. Clark that the advantage of a large proportion of tube surface is lost, because there is then not sufficient water around them to absorb the heat. In making experiments with locomotive boilers the amount of water they hold should always be given, and it is believed that their efficiency would always bear some relation to the proportion which their water capacity bears to the heating surface.

Of course, in speaking of grate area what is meant is the portion of the grate which is perforated, and through which air can pass to the fuel. This, which is the effective area, can be contracted or enlarged by either increasing or diminishing the size of the dead plates, so that it is always in the power of a person having charge of locomotives either to increase or diminish the area of the grate within the limits of the size of the fire-box.

We have called attention to this subject again, because, as Mr. Martin well expressed it in his report (published in the *Railroad Gazette* of Aug. 10) of experiments made to determine the best proportion of effective area of grate, "a judicious arrangement of grate-bar opening and dead plates will effect as great an economy as any other single improvement in a locomotive," which is perhaps only another way of saying, as Mr. Clark did, that a grate cannot be too small so long as a sufficient quantity of coal can be burned in it.

It should not be inferred, however, that because the effective area of the grate may be contracted to advantage, therefore the space above it, or, in other words, the size of the fire-box, is not important. A large space, with a small grate, gives more room and more time for the combination of the gases after they leave the grate than a smaller space, and therefore combustion will be more perfect with the first than with the last. The end to be aimed at is to have as small a grate as practicable, and then give as much room as possible for combustion and as much surface as can be given to absorb the heat.



### The Prevention of Railroad Strikes.

Under this head Mr. Charles Francis Adams, Jr., has contributed letters to *The Nation* of Aug. 30 and Sept. 6, in which he urges the attention of railroad companies to the organization of their service in such a way as to attach their employes to them by stronger and more lasting ties than those which arise from the ordinary relation of employer and employed, by regularity in promotion, provision for temporary disability and pensions for the superannuated, etc., founding his remarks on M. Jacquemin's account of the plan followed by the Eastern Railroad of France previous to 1868, a translation of which was published in the *Railroad Gazette* last winter under the title of "Railroad Employes in France," and afterwards in pamphlet form. Mr. Adams is confident that the adoption of some such plan by American companies would virtually exempt them from the danger of strikes. We are able to say that the system which had worked so satisfactorily on the Eastern Railroad of France down to 1868 still proves effective. M. Jacquemin, who is still the manager of that railroad, in a note of recent date has informed us that substantially the same plan is continued in operation, with eminently satisfactory results to the company. And this is more significant than might be thought, for there was likely to be a severer trial of it after than before 1868. Since that date France, with the rest of Europe, has passed through a period of a great and rapid rise in prices, and especially in wages, followed by a rapid and considerable fall. A system which might work well during a period of stationary wages might well fail in times of great fluctuations of wages. It is therefore interesting to know that the French plan has continued to work well in recent years.

The subject is now evidently attracting a good deal of attention in this country. Many of our leading railroad men since the strike have been examining the plan described by M. Jacquemin, and some, we understand, are now endeavoring to design something similar for the use of their own companies.

The conservative influence of such an organization consists in the fact that it gives the regular employe certain property rights which are alienated by deserting the service of the company. Among these are a constant interest in a provident fund, for cases of temporary disability or other need; a growing interest in a pension fund or life insurance, which of course becomes greater the longer the employe remains in the company's service; and, not least effective, a claim to promotion by virtue of long faithful service, the value of which cannot be exactly measured, because the chances depend on the occurrence of vacancies, though when promotions in all ordinary grades are confined to regular employes of lower grades the value soon becomes evident and has a tremendous effect, as may be seen in the military service of almost all countries, where men are content to serve for years in insignificant positions, because they are almost certain, sooner or later, to get some promotion, and have at least a chance of rising to high rank.

It is indispensable to the success of such a system in railroad service that there should be two classes of employes, only one of which is considered as permanently engaged. Otherwise the corporation might be making engagements for a distant future with some men whom, in the course of events, it would have to discharge for lack of employment. Its regular staff, permanently engaged, should be no larger than will serve for its minimum necessities, thus requiring under ordinary circumstances the temporary employment of a considerable number of men—a practice otherwise desirable because it enables the company to make the selections for its permanent force after trial, and makes the appointment to this permanent and regular staff in itself a promotion—likely to be the most highly prized of all, as it assures the future of the employe.

We do not see, however, as the French system makes any provision for changes in the standard of wages, such as are made necessary by great changes in the value of currency, in the cost of living, in the demand and supply, etc. It does, however, make it very improbable that the changes will be made through strikes; and, as we have said, as France has within the past five or six years passed through two revolutions in prices, as they may be called, since the plan went into effect, it seems that it can be made to provide also for the rise and fall of wages.

### Erie Reorganization.

After a season of apparent inactivity and indifference, there is again a movement among the English stock and bondholders of the Erie Railway. The Americans seem never to have troubled themselves about the company since the road went into the control of the Court. This is not strange, so far as bondholders are concerned, for scarcely any of the bonds on which interest is unpaid are held in this country: and we suppose that the inactivity of stockholders must be regarded as evidence that there is little stock left in America. For a long time the stock was held in England

much above any reasonable present or prospective value, and we suspect that advantage was taken of that fact by American holders to market their shares. At all events they seem to raise no voice in the discussions concerning the reorganization, etc., which are often fierce and bitter in England.

There was recently a meeting in London of the association of share and bondholders who have agreed upon the pending reconstruction scheme, at which Sir Edward Watkin, the chairman, made a statement of the number of shares and bonds which have assented to the reorganization scheme. This shows that about 78 per cent. of the bonds support the plan, and 43 per cent. of the stock, including, we believe, a majority of the preferred stock. The important thing is the adherence of the stockholders, for this implies not only consent but contribution on their part, as the scheme requires them to pay an assessment on every share. Probably this has been the chief obstacle to the success of the scheme, for, though the only other alternative actually is the forfeiture of the shares, by the foreclosure of the mortgages in the interest of the bondholders alone, yet there are doubtless many English holders who are loth to believe this, especially as Mr. James McHenry, long regarded as the great authority on Erie and its "rescuer" from the hands of the Gould management, persists in asserting that the road as it is, under the actual circumstances, is capable of earning enough to pay interest on all its bonds with a surplus for dividends on the preferred stock.

The weak point of the scheme is rather that it requires so small sacrifices from the stockholders and provides for the reorganized company a dangerously large funded debt. The fact is, the Erie Railway property—at least all of it that is worth building—could be replaced to-day for the face of the bonded debt. There are several branches which are worth very little and which no one would construct after the experience that has been had with them. It is true that the road might be able to pay a very large interest on the sum which would replace and improve it as it should be improved, because its chief competitors have also cost somewhat more than it would cost to replace them. But we should say that the company would not have anything like the "factor of safety," with the debt contemplated by the reorganization scheme, that is desirable in a railroad company. This will appear if the company, after reorganizing, shall attempt to borrow money to make the improvements absolutely necessary to enable it to compete much longer for through traffic. Chief Engineer Chanute estimated last fall that about \$15,000,000 would be needed for this purpose. Only a small part of this will be supplied by assessments on the shares, even if all consent to the scheme, which they will not do, we may be sure. Something may be furnished by the temporary funding of coupons, but very little unless the road does better than it did last year, which it may and may not do; and of course it will not be necessary to spend all the money at once. But it is very probable that the company may need to borrow money to complete these much-needed improvements. It would be very hard indeed to get it with the present amount of debt, increased as it will be by the funding of coupons. It is not enough that the net earnings should be large enough to pay all interest and other fixed charges. Unless there is a considerable margin above such charges the company can never borrow on good terms, if at all.

It is, however, of great importance that the reorganization, in some form, be made as quickly as possible, as very little can be done to improve the property until then; and there is no surer way to ruin it completely than to leave it a few more years in its present position, for the ablest management in the world cannot produce good results with imperfect tools. The Erie has now an unusual number of exceptionally able men on its staff, but, indispensable as brains are, something more is needed—locomotives, cars, steel rails, sidings, second tracks, change of gauge, terminal facilities, and other things which able men can make a good use of, but which only money can procure. And as the London scheme actually is the only one presented, for the opposition present no plan of their own, and especially as the opposition would certainly not present a stronger plan, but a weaker one, it is probably best that the pending reconstruction scheme be carried out.

### Foreign Railroad Notes.

It has been proposed in Germany to indicate all stations, to the public as well as the employes, by numbers, and to print on tickets, under the numbers indicating between which the passenger rides, the time the train is due at his destination, to prevent his being uneasy lest he may miss it. Thus, suppose New York to be station 1 and Philadelphia 15, and the train due at Philadelphia at 4 p. m., the face of the ticket would read: "1-15" (in very large figures) and underneath these figures "4 p. m." The traveler knowing he was not due until four o'clock would not be likely to begin to worry until that time. Then it is claimed that station signs could be made much plainer by figures than by letters, because they could be very large, and on transparencies which could be illuminated

by night, so that the traveler could hardly fail to distinguish them at any hour.

In Hungary it is required that the railroad companies report monthly to the Minister of Communication the names of employes who may have been discharged for cause, with an account of the fault in each case.

The Hanover State Railroad (having 530 miles of road) in 1876 received an average of 1.20 cents per passenger per mile and 2.16 cents per ton per mile. The working expenses were 60.29 per cent. of the receipts.

The Swiss Northeastern Railroad in 1876 received an average of 1.35 cents per passenger per mile and 2.88 cents per ton per mile. The working expenses were 70 per cent. The heaviest coal carrying road in Prussia (the Berg & Maerk) received in 1876 an average rate of 1.31 cents per ton (of 2,204 lbs.) per mile, the average length of haul being about 43 miles. The lowest rate received by any Prussian road (out of eight coal-carriers) was 0.99 cent per ton per mile (average haul 122 miles), and the highest 1.63 cents (average haul 15 miles). The changes in rates have been very slight for many years, but on five of the eight roads they are a little higher now than they were in 1873, and in one case they are higher even than in 1850. The road which received 1.31 cents per ton per mile for coal received the same year 1.65 cents for all freight, including coal, and 1.36 cents per passenger per mile. Of its total receipts 43½ per cent. is from coal.

The Russian railroads are in one respect profiting by the war, inasmuch as their traffic is greatly increased thereby, and their gross receipts for the month of April were 20½ per cent. greater this year than last. On the other hand, however, the paper currency of the Empire has fallen in value so greatly that a great increase in receipts may not indicate any increase in profits. We have been through the same experience, but our roads had generally freedom to raise their rates as the value of the currency went down, which the Russian roads have not. The 210 miles of narrow (3 ft. 6 in.) gauge road in Russia earned \$200 per mile in April. These roads were opened five or six years ago, but though Russia has continued to build new railroads, most of them where only a thin traffic could be expected, and all after general plans specified by the Government, which built the narrow-gauge roads, no more narrow-gauge roads are built. The standard Russian gauge is 5 ft., but it has 325 miles on the German frontier of 4 ft. 8½ in. gauge.

### Record of New Railroad Construction.

This number of the *Railroad Gazette* has information of the laying of track on new railroads as follows:

*Scioto Valley*.—Track laid from Portsmouth, O., northward 15 miles.

*Springfield, Jackson & Pomeroy*.—Extended east by south 8 miles to South Charleston, O. It is of 3 ft. gauge.

*Dayton & Southeastern*.—Extended from Washington Court House, O., southeast to Frankfort, 18½ miles. It is of 3 ft. gauge.

*Western, of Minnesota*.—Track is laid on this line (formerly the Brainerd Branch of the St. Paul & Pacific) from Brainerd, Minn., south 18 miles.

*Burlington, Cedar Rapids & Northern*.—The *Pacific Division* is extended from Rhinebeck, Ia., northwest to Grundy Centre, 9 miles.

This is a total of 68½ miles of new railroad, making 1,176 miles completed in the United States in 1877, against 1,467 reported for the corresponding period in 1876, 702 in 1875, 1,006 in 1874, 2,455 in 1873, and 4,498 in 1872.

THE PETROLEUM MOVEMENT continues remarkable, both in extent, which is unparalleled, and in its distribution, which exhibits a great change from previous years by reason, we suppose, of the refusal of the Standard Oil Company to ship by the Pennsylvania Railroad. Last year 26½ per cent. of the total shipment of the oil regions in June and July were made to New York; this year 48½ per cent. On the other hand, Pittsburgh got 13½ per cent. this year against 18½ last, and Philadelphia less than three per cent. this year against 9½ last. This, however, does not show the extent of the change, as a very large part of the exports of the seaboard cities are of refined received from Cleveland or Pittsburgh and not counted in the shipments of the oil regions. Of the total exports for the eight months ending with August, 72½ per cent. were from New York, against 56 per cent. last year, while from Philadelphia they were but 12½ per cent. this year against 26½ last. We called attention two months ago to the fact that Baltimore, though not holding its rank in the earlier months of the year, had begun to recover it; and this movement has continued. During July and August its exports were nearly two-fifths larger than for the corresponding months last year, and amounted to 13½ per cent. of the total exports against 14½ last year. Philadelphia shows worse than before, exporting in the two months 9 per cent. of the total against 23½ last year. The exports for these two months are much above the average of this year even, and nearly three-quarters was from New York, which in those two months exported more than in six months last year and more than all the other ports put together have exported during the entire eight months of this year.

THE WESTINGHOUSE AUTOMATIC BRAKE has been finally adopted by the administration of the Belgian State railroads for use on all passenger equipment, an appropriation has been made by the Belgian Parliament to cover the expense, and orders have been given for the attachment of the brake on several hundred cars and a corresponding number of locomotives. This step was taken in accordance with the recommendations of a commission of three government engineers appointed to investigate and report upon the question of brakes. They conducted elaborate experiments with the Westinghouse atmospheric, the Westinghouse automatic, and the Smith vacuum brakes. The reasons for their decision in favor of the



automatic are summarized as follows: "1. Its action is prompter and more energetic. 2. It gives all the advantages resulting from automatic action. 3. It is more economical." As Belgium railroads have close relations with French lines on one side and German ones on the other, they will serve well to exhibit the brake to the chief part of the Continent.

WATER RATES have fluctuated somewhat during the week ending with Tuesday. Lake rates were 2½ to 2¾ and 3 cents per bushel for corn from Chicago to Buffalo and about 3¼ for wheat (the latter now an important part of the shipments), closing at the higher rate. Canal rates, which had yielded a little at the beginning of the week (6½ against 7 cents for nearly the whole previous week) fell still further to 6¼, 6½ and even 6 cents a bushel for corn from Buffalo to New York, closing at 6¼. Fluctuations in ocean rates have not been great. They close pretty firm at 10d. to 10½d. per bushel by steam to Liverpool from New York. Rates by sail to Cork for orders are quoted Tuesday at 7s. to 7s. 3d. from New York, Philadelphia and Baltimore.

THE AUGUST GRAIN MOVEMENT, as indicated by the receipts at Northwestern markets, was the largest on record, except in 1873—greater by 23½ per cent. than in 1876, by 34 per cent. than in 1875, by 17 per cent. than in 1874, and less by only 5 per cent. than in 1873. The corn receipts were larger than ever before, the wheat receipts one-half larger than last year, but smaller than in previous years, as the new crop had only begun to come forward and the old crop had been nearly all marketed. There has been, however, no single week in which the business approached that of the last week of August in 1873, when more than seven millions of bushels were received at these ports, including nearly 4,000,000 bushels of wheat.

AUGUST EARNINGS show, as appeared probable a month ago, a turn in the tide. The comparisons with 1876 become generally favorable, and the decreases which had lasted so many months have, many of them, become increases. Of thirteen roads which have reported so far, ten show an increase, including some which have shown a decrease for the previous months of this year. The aggregate amount of increases is about \$280,000, against \$85,000 of decreases, while for the entire eight months ending with August the same thirteen roads show an aggregate decrease of \$950,000.

THE URAL RAILROAD, which the Russians have begun to build in the extreme East of Europe, has, we are told by Russian newspapers, come to a standstill on account of a strike, 500 laborers having stopped work. Unlike their American prototypes they seem not to have guarded the works to keep other men off, for it is expressly stated that when they stopped work they went home. When Russian laborers strike, then anything may be expected.

#### NEW PUBLICATIONS.

*A Manual of Rules, Tables and Data for Mechanical Engineers*: by Daniel Kinnear Clark. London: Blackie & Son.

Books, like nearly all other things, may be divided into three classes, good, bad and indifferent. Mr. Clark's new manual may unhesitatingly be ranked in the first class. In general character it resembles such "pocket books" as Haswell's and Trautwine's, but instead of being a pocket book it is a large volume of 984 pages which measure 6×9 in. It is printed on heavy tinted paper, and therefore it is a thick book, not at all resembling a "pocket book." In its general character it resembles Trautwine's book more than any other; but that, as most of our readers know, is a pocket book for civil engineers, whereas Mr. Clark's manual is intended for mechanical engineers. The two books resemble each other in the fact that instead of containing only rules, tables and memoranda, they each have what may be called dissertations on the subjects treated. Trautwine's book is, however, printed in very small type and on thin paper, so that it is comparatively small, though somewhat larger than the usual pocket book. Mr. Clark's manual refers to a very different range of subjects, as it treats of mechanical and not civil engineering, although, of course, some subjects are common to both. Perhaps no better idea can be given of the character of Mr. Clark's work than to quote the titles of the chapters. These are: "Geometrical Problems," "Mathematical Tables," "Weights and Measures," "Money—British and Foreign," "Weight and Specific Gravity," "Weight of Iron and Other Metals," "Fundamental Mechanical Principles," "Heat," "Steam," "Mixture of Gases and Vapors," "Combustion," "Fuels," "Application of Heat," "Strength of Materials," "Strength of Elementary Constructions," "Work or Labor," "Friction of Solid Bodies," "Mill-Gearing," "Evaporation Performances of Steam Boilers," "Steam Engine," "Flow of Air and Other Gases," "Work of Dry Air or Other Gas Compressed or Expanded," "Air Machinery," "Flow of Water," "Water Wheels," "Machines for Raising Water," "Hydraulic Motors," "Frictional Resistances."

The two chapters on "Geometrical Problems" and "Mathematical Tables" might not inaptly be called mathematics for practical men. They give, in fact, a summary of practical geometry, mensuration and trigonometry in such a concise form as every man actively engaged in engineering has often occasion to use and refer to. What he then wants is a book in which can be found in the shortest possible time exactly the fact or the theory he wants to use. For such persons these chapters are admirably adapted.

The chapters on "Weights and Measures" and on "Money" show the confusion which exists the world over regarding these matters. The advocates of the metric system have here a text from which they could preach a very forcible sermon. The portion referring to wire gauges is almost comic in its diversity. There are six different English wire gauges given. Besides these there are, we believe, several which originated in this country. So great is the confusion on this subject that, to express a dimension as such a number wire gauge would not

mean anything definite, unless it was stated what special gauge was meant.

The tables of weights and specific gravity are unusually full. Of course, any careful examination of these tables is quite out of the question in a review of this kind, but from an examination of the tables and data it would seem as if almost any information which might be desired could be found under its appropriate head.

A similar remark might be made of the chapter on "Fundamental Mechanical Principles" that was used to describe the chapter on "Geometrical Problems." If the one is mathematics for practical men, the other may be called mechanics for the same class. The explanations of such matters as the "centre of gyration," "work accumulated in moving bodies," and "work done by percussive force," are remarkably clear and concise.

In the chapters on "Heat" and "Steam" will be found a condensation of all the latest information relating to these interesting subjects. Our remarks would assume the character of a table of contents if we undertook to give an idea of the scope of these chapters. They give in a very lucid and condensed form the substance of the information contained in larger treatises on these subjects, so that information relating to them is easily accessible with an expenditure of a very little time. The same thing is true of the chapter on "Combustion."

The subject of "Fuels" is discussed very fully, and information is given regarding coal and other fuel from all parts of the world. To our shame be it said that no other information worthy of the name was procurable concerning American coals, excepting that contained in Prof. Johnson's report made in 1843-44. The experiments which were the basis of his report were very complete, but since then large coal fields have been opened, and many qualities which were then unknown are now extensively used.

It is, in fact, difficult to describe the book without becoming monotonous in reiterating the same commendation of every part. Mr. Clark's plan seemed to be to take up the subjects treated and then seek all the attainable information relating to them and put it into as condensed a form as possible. The chapter on the "Applications of Heat" illustrates this, as all the others do. The transmission of heat through solid bodies is fully treated, then the heating and evaporation of liquids through metallic surfaces, the cooling of hot water in pipes, the condensation of steam in pipes, warming and ventilation, evaporation in the open air, desiccation and heating of solids.

The discussion of "The Strength of Materials" occupies 182 pages, derived chiefly from English sources, and is undoubtedly very valuable, but is deficient in not giving the results of German investigations, like those of Woehler, and others made in this country by Prof. Thurston. By representing graphically the action of material under strain, not only its ultimate strength is determined, but other qualities, such as elasticity, ductility, etc., are clearly shown. The "autographic" method, by which the material is made to draw an outline of its own character, promises, or rather has established, a new era in the investigation of the quality of materials.

The discussion of the "Strength of Elementary Constructions" contains the results of experiments made to determine the strength of rivet joints, columns, beams, railway rails, steel springs, ropes, chains, bolts and nuts, stay bolts, cylinders, tubes, pistons and boilers. There is also a brief discussion of the strains of framed work, such as cranes, girders, roofs, etc.

The treatment of the "Friction of Solid Bodies" is comparatively brief, and any one in search of any complete information on this subject will look in vain here, as he will every where else, for it, so that the reader will probably renew his hope that the coming investigator who is to make this subject clear will soon begin his labors.

"Mill Gearing" has 40 pages devoted to it, which forms a very useful compendium of that art. Besides discussing the subjects usually found in the treatises on this subject, much information of comparatively late date, such as frictional wheel-gearing, rope gearing, etc., are discussed.

Probably no portion of the book will have more interest for railroad mechanical engineers than that which refers to the evaporative performance of steam boilers. The information which is condensed here is spread over a very wide field, and to the general reader is therefore inaccessible. Among other things it contains a report of the experiments of Woods and Dewrance in 1842 to determine the evaporative efficiency of locomotive boiler tubes. These same experiments were repeated by M. Paul Havrez in 1874. In both cases it was found that the first six inches of the tubes next the fire-box did more work than the remaining 60 inches of tube. The record is, however, provokingly silent with reference to the important point whether the experiments were made with a forced blast, which is the condition under which a locomotive boiler is always worked, or whether they were made with the draft of an ordinary chimney.

The following conclusion, stated by the author in this chapter, every master-mechanic should lay to heart and hang up in his office in the form of an illuminated text. It is that "there can never be too much heating surface, as regards economical evaporation, but there may be too little; and that, on the contrary, there may be too much grate-area for economical evaporation, but there cannot too little, so long as the required rate of combustion per square foot does not exceed the limits imposed by physical conditions."

The limits of this notice will not permit any careful examination of the chapters on the "Steam Engine" and on the "Expansive Working of Steam," "Flow of Air," "Air Machinery," "Water Wheels" and "Frictional Resistances." The much-disputed subject of the economy of the compound engine is discussed quite fully in the chapter on the steam engine, but to examine it critically would require more time and room than can now be given to it.

Altogether, Mr. Clark's book may and should be commended

very highly. It is vastly the best book of the kind ever yet published. It contains no mathematics with the exception of a little simple algebra and can be comprehended by the ordinary reader who is without the accomplishments of a knowledge of the higher mathematics. The book, it is quite safe to predict, will become the office companion of nearly every mechanical engineer who takes any pride in his profession.

#### The Limits of the Authority of Courts and Their Receivers.

The following is a letter, bearing the signature "Jurisprudence," which appeared in the Boston Advertiser of Tuesday last:

Within the last few years, the courts have been frequently resorted to for the purpose of enforcing the rights of creditors of embarrassed or bankrupt railroad corporations, who hold security either upon the property or the earnings of such corporations. Suits have been instituted by the holders of notes or bonds secured by mortgages of railroads for a foreclosure of such mortgages, and a sale of the property for the benefit of the mortgage creditors; and whenever railroads have been fully completed, and put in operation before any default upon their indebtedness, the remedy by foreclosure and sale ordinarily proves adequate, and is all that the creditors desire.

Where, however, the construction of a railroad is arrested by financial embarrassments, especially if the failure to complete it will result in a forfeiture of bounties, land-grants or prospective advantages of any kind, and it becomes desirable to raise money for completing the enterprise in order to save what may have been already expended, it is customary in the United States for the security holders who are in danger of losing their investment, after commencing foreclosure proceedings—or as incidental thereto—to appeal to the courts to assume the temporary management of the undertaking, through officers called receivers, in advance of such foreclosure or sale. By this means the bondholders are enabled, in anticipation of the foreclosure or sale of the mortgaged estate, through loans obtained by the receivers, to raise and expend money upon the road, and thus to increase its value, so as to avoid, perhaps, a great portion of the loss which would have resulted, had the foreclosure and sale taken place before the property had been put into a condition capable of yielding income. No one is injured by this practice, since if more is realized on the subsequent sale than is required to pay in full both the mortgage debt and the outlay made by the receivers, it will be paid over to the mortgagor. The court, it is true, will have gone into possession of the mortgagor's estate before foreclosure, for the benefit of the mortgagee as equitable owner, but this is done upon the presumption that no redemption is intended, and without prejudice to the right of redemption, in case the debtor party concludes to redeem before sale, as he may.

It is because of this presumption that the whole property or interest will practically go to the mortgagees prosecuting a foreclosure suit, that they have been allowed, by the agency of receivers appointed by the court, to raise money by loans upon the credit of the mortgaged estate, to be reimbursed from the proceeds of the sale, before any payment is made on account of the mortgage debt itself.

This mode of raising money to finish railroads, by giving priority over existing mortgages in the payment of sums so borrowed on receiver's certificates, is supposed by some to be a violation of ordinary legal rules and principles, or an exception to such rules; and so it would be if this were ever done except at the instance or for the benefit of the prior existing mortgage security-holders themselves, or at least of a large majority of them.

The power of the courts to give receiver's loans precedence of right over existing mortgage titles, against the will of the mortgagee, has never yet been asserted, we believe, in the courts of this country, if any such power exists; nor has the exercise of such power been attempted as yet, in any court of last resort, against the opposition of any considerable number of the holders of such prior existing mortgage securities, though this matter has been under discussion as an abstract question, and different opinions expressed thereon by different judges.

If any court in the exercise of its discretion as manager of railroad property should undertake to supplant or override the previously existing legal rights of security-holders without their consent, it will present the question, whether the constitutional guarantee of the right of private property is not thereby infringed or invaded by the very tribunals established chiefly for the protection of such rights.

A very large number of railroad mortgages are now in course of foreclosure in the United States, and many cases have already reached a conclusion. As the proceeds of sale usually fall short of satisfying the secured debts, the usual course is for the old security-holders to become the purchasers, at the sale of the property, at an agreed price payable in the old securities, and then to organize a new corporation discharged of all embarrassing indebtedness.

Perhaps the most remarkable instance of railroad receiver-ship management, so-called, relates to the Vermont Central Railroad, in a case now pending in the courts of Vermont. The case has little, if anything, in common with the cases above referred to, in which receivers have been appointed at the instance and for the benefit of mortgage bondholders, and in many, if not in all, its features it is unprecedented in the history of railroad litigation; and, though quite familiar to the public by name, it is very little understood in its legal aspects.

This suit was originally instituted by the Canada Railroad Company many years since, in order to enforce a provision in the lease of its railroad to the Vermont Central Company, by which the Vermont Central Company, as lessee, undertook to pledge the earnings of its own railroad as security for the rent payable to the Canada Company for its road. When the rent due to the Canada Company had become payable and in arrears, the Canada Company sued for such arrears, and in the suit the Court was asked to enforce the pledge of income given to the lessor party by the Vermont Central, through receivers to be appointed by the Court to collect the income and apply it in paying the overdue rents as provided by the terms of the lease, that, whenever all arrears of rent should be paid in full, the Vermont Central Company should at once be restored to possession of its own railroad and the receipt of its own income, as well as that of the road of its lessor.

By final decision rendered in 1861, the Supreme Court of Vermont granted the relief prayed for, and appointed receivers to hold possession and satisfy and pay off all rent arrears, out of the earnings of the two railroads.

The receivers had proceeded in the execution of this final decree for about two years only, when an agreement or composition was entered into by which the Canada Company, the judgment creditor, agreed to accept in lieu of the arrears of its rent in money, an equal amount of its own capital stock, to be issued to it in liquidation of the arrears,—upon the understanding, however, that its rent for the future should be increased by an amount equal to 8 per cent. per annum upon the additional capital stock so to be issued to stockholders in settlement of these arrears. In the final decision of 1861, however, the court had, among other things, determined that the lien of the Canada Company for its rent, upon or against the income of the Vermont Central road, was by law limited to 8 per cent. upon the sums actually expended in constructing the Canada Railroad. So that, according to this decision, if the



Canada Company accepted this increase of the capital stock in lieu of money for its rent arrears, it would not in future, in case a default of rent should occur, be able again to obtain the aid of the court for enforcing the same through receivers appointed for this purpose, as before.

This consideration was not, however, deemed sufficient to deter the Canada Company from entering into the compromise agreement for funding all its rent arrears into new capital stock; but an attempt was made to guard against the danger of losing the receivership remedy, in case of any future default, by omitting to show, in any distinct way, the fact that the new stock, when issued to the Canada Company, was to operate as a payment or legal satisfaction of all the arrears of rent provided for by the decree of 1861, and also by keeping on foot the old suit, and thus affording the receivers, under the decree of 1861, an ostensible authority for holding over, as it were, and for proceeding to collect the future accruing rents in the same manner as though they had been originally appointed for that purpose, or, as though the collection of future accruing and enlarged rents came within the terms or meaning of the decree of 1871, relating to rent in arrears, as was not the case.

The precise mode of attaining this object was as follows: The Canada corporation got up a petition to the court, which was called a supplemental bill in the old suit, therein setting forth that the parties in interest had agreed to a new programme, that the rent be enlarged beyond the limit fixed by the decree of 1861 and the terms of the lease, viz., to 8 per cent, on \$2,000,000, and had agreed, in substance, that the receivers of the court should continue in possession as before, for the purpose of taking the income and paying the rent as it should become payable in future, on the enlarged basis for all time (the lease being perpetual), and the court was asked to enforce this agreement specifically by a supplemental decree to be entered in the old suit.

The Chancellor to whom this application was made granted it, and entered an order or decree in the old suit in conformity therewith, entitled a supplemental decree in the old suit.

By this means, if this proceeding was regular, lawful and binding, as an adjudication, to its full extent, the Canada Company had procured a decree, whereby a suit for the collection of past-due rent, through the agency of a receivership or court management, became converted into a machine whereby the officers of the court were placed in permanent possession of a railroad for the purpose of preventing any default in the payment of the future rent, chargeable to it under the covenant contained in the lease, as modified by parties, and this, too, merely upon the allegation that the lessor party (or petitioner) desired such an adjudication, and that the other parties in interest were either willing that such new decree be made, or did not, after legal notice, appear to object.

A perpetual receivership, for the purpose of preventing any future breach of the covenants for rent contained in a lease, was thus, to all appearance, inaugurated by one of the chancellors in the State of Vermont in 1864,—a feat the like of which probably was never attempted, before or since, in any judicial tribunal.

Under this arrangement, if valid and binding in law, the Vermont & Canada Railroad Company (party lessor) was put by the court through its officers permanently in possession of the estate belonging to its lessee, the Vermont Central Railroad Company, before any breach by its lessee of the newly-made contract, for the purpose, as would seem, of preventing the possibility of any such breach. Such a security for rent as this, in which a court had lent its aid to a lessor to prevent the possibility of a non-payment of his rent, is not described in any book of law reports which has ever come to our notice.

Directly after the entry of this supplemental decree—so called in the old suit—all rent arrears, provided for in the old suit, were at once adjusted and satisfied; and the new departure was taken, apparently, under the most favorable auspices, and the plan worked well for a time in securing the prompt payment of its rent to the Canada Company. The income proved sufficient, and more than sufficient, to meet the Canada rent payments as they matured, and the receivers promptly paid the same.

In fact, the plan had worked so well and yielded so satisfactory results down to 1870, that the receivers came to think that if they had a few more railroads under their control they could realize still better results. In order to enlarge the field of their operations, the receivers then bargained for the possession of the Ogdensburg and Rutland railroads and the fleet of the Northern Transportation Company, and, by leave of the court, annexed these several acquisitions to the railroad domain of the court.

In this way the Court of Chancery for Franklin County, Vt., in a suit, originally brought solely to enforce a security for arrears of rent due to the Canada Railroad Company from its lessee, had in 1871 undertaken the control and management, not only of the Vermont Central road, owned by the lessee, but also of the Rutland and Missisquoi roads in Vermont, of the Ogdensburg road in New York, of the Stanstead, Shefford & Chamblay road in Canada, and a fleet of steamers on the great western lakes.

These new enterprises, as might be expected, proved disastrous, and resulted in losses and debts against the receivers of several millions of dollars, so that finally no further payments by them to creditors were possible, all the income being required merely for keeping the machinery in motion.

The debt of the receivers had in fact become as great or greater than the value of all the property originally entrusted to them by the court, for the collection of income only.

Under these circumstances the receivers, in December last, again resorted to the Court of Chancery, and asked that Court to order a sale of the railroads originally placed in their possession, and to have the proceeds of the sale devoted to the payment, in the first instance, of the entire receivers' liability, so far as they would go; as if the Court by sanctioning the acts of the receivers, had virtually charged the two railroads with the payment of all the indebtedness incurred by the receivers, without any regard to the origin or occasion of such indebtedness, or to the question whether such debts were also debts of the railroad corporations or of either of them.

This proposed sale of the two railroads, by order of the Court, is resisted by the Canada Company and the holders of the Vermont Central mortgage securities on various grounds, and among others on the ground that the orders and decrees of the Chancellor, entered in the old case, after the final decree of 1861 (and not in pursuance or execution of said final decree), were in excess of the power of the Chancellor, and null and void for want of jurisdiction over the parties or subject matter, and for irregularity generally, and consequently that no sale of the railroads is now justifiable, as any part of the proceedings in the old suit, or within the remedies there invoked; and that if such sale could be lawfully ordered and decreed by the Court under any circumstances, it could be so done only upon new proceedings instituted for that purpose, in which the debt of receivers, or trust debt, so called, should be first declared to be a valid lien upon the two railroads and entitled to payment therefrom, after due notice to all parties holding valid incumbrances thereon prior to those of the trust creditors.

It is quite obvious from the foregoing statement that this case presents many novel questions as to the power of courts of justice in supplanting or overriding vested rights of property or securities, either directly or as a consequence of the exercise, by its officers, of powers conferred on them by the Court, which result in the creation by them of large debts.

When these powers have been conferred upon receivers at their own request only, and not at the request of a party hold-

ing some right or title in the property which is being enforced by the Court for the benefit and at the instance of such party, it is difficult to understand how anything whatever can be pledged or charged with liability, unless it be the receivers personally, or such funds as they officially own, or have some title or property in.

In the case of mortgage creditors, holding title to their debtor's property and asking the Court to charge that title with a liability having precedence over their own rights, there is no difficulty, because the Court is supplied by the creditor party himself with the title which is to be so pledged or made use of.

But here, the creditors before the Court asking for this sale are either the receivers themselves or their creditors for debts growing out of the enlargement (at their own request) of the scope of the original receivership, which debts were neither anticipated nor authorized by the Court, unless as a consequence of certain acts of the receivers which were authorized. Hence these debts were, as it would seem, wholly without any provision for security in their origin, and they have now become entitled to security at the hands of the Court, if at all, because of some theory or fiction of law, that, if the officers of the Court have got into debt beyond their means, it is within the duty and power of the Court to find some way to get them out, regardless of the rights of all other parties in bringing this about. We understand one of the questions raised in this case is, whether the railroad of the Vermont & Canada Company, the orator in the old suit, and the creditor party for rent (as lessor of its railroad), was just as much in the receiver's hands and power under these proceedings as the railroad of the Vermont Central Company, the party defendant; and, if so, whether it is liable to be sold to satisfy these debts of the receivers.

In a suit brought by mortgage bondholders to foreclose their mortgage of the Pacific Railroad of Missouri, wherein receivers were prayed for, Judge Dillon refused the application for receivers on the ground that the railroad being then under lease to another corporation, such lease could not be superseded and receivers thereof appointed by the Court.

Another and more difficult question for the Court, we suppose, is, whether the so-called supplemental decree of 1864 and all the subsequent supplemental orders of the Court in this case are now revolving within the paths laid down for them in the books of legal astronomy, or are so eccentric in their character and orbit, as to be beyond the reach of any legal recognition, classification or calculation whatever.

The solution of these various problems is likely, we imagine, to prove somewhat puzzling, even to the learned and able Court which now has the case under advisement.

## General Railroad News.

### ELECTIONS AND APPOINTMENTS.

**Bennington & Rutland.**—Mr. C. W. White is appointed Superintendent.

**Boston & New York Air Line.**—Mr. Wm. Lowell has been appointed Master Mechanic and took charge Sept. 1. Mr. Lowell has been 23 years on the New York, New Haven & Hartford road, as engineer and shop foreman.

**Chicago & Canada Southern.**—At a meeting held in New York, Sept. 10, the following officers were chosen for the ensuing year: President, Sidney Dillon, New York; Vice-President, James W. Converse, Boston; Secretary and Treasurer, Benjamin F. Ham, New York.

**Chicago, Milwaukee & St. Paul.**—Mr. Dwight W. Keyes is appointed Assistant General Freight Agent for all divisions east of the Mississippi River, and Mr. A. J. McCormick Assistant General Freight Agent for all divisions west of the Mississippi.

**Connecticut & Passumpsic Rivers.**—At the annual meeting in Newport, Vt., Sept. 5, the following directors were chosen: Lucius Robinson, Newport, Vt.; Stephen Foster, Stanstead, P. Q.; T. P. Redfield, Montpelier, Vt.; Alden Speare, Newton, Mass.; Emmons Raymond, Cambridge, Mass.; Gardner C. Brown, Amos Barnes, Warren K. Blodgett, John E. Lyon, Boston. The board elected Emmons Raymond, President; T. P. Redfield, Vice-President; N. P. Lovering, Treasurer; E. Cleveland, Secretary.

**Columbus & Gallopis.**—Col. J. R. Strangthen has been appointed Chief Engineer.

**Harrisburg, Portsmouth, Mount Joy & Lancaster.**—At the annual meeting in Philadelphia, Sept. 7, the following directors were chosen: Thomas A. Scott, Geo. B. Roberts, James Magee, Wistar Morris, John M. Kennedy, Josiah Bacon, N. Parker Shortridge, James Young, Middletown; Lewis Elkin. The road is leased to the Pennsylvania.

**Indianapolis & Evansville Mineral.**—At the annual meeting in Indianapolis, Sept. 6, the following directors were chosen: J. C. Albert, L. Fletcher, J. Gramelspacher, J. H. Kappes, Howard C. La Force, John Love, T. A. Morris, J. J. Moore, Charles D. Pearson, A. W. Prather, R. M. Wellman, C. T. Woolfolk.

**Indianapolis & Sandusky.**—The first board of directors of this new company is as follows: A. H. Miller, Indianapolis; Calvin S. Brice, Lima, O.; Charles Foster, Fostoria, O.; W. H. Andrews, I. H. Burgoon, C. O. Tillotson, Fremont, O.; James B. Hodgskin, New York.

**Kansas Pacific.**—Mr. W. L. Malcolm is appointed General Eastern Agent, with headquarters in New York. He was until recently General Passenger Agent of the Wabash road.

**Lake Shore & Michigan Southern.**—Mr. Frank O. Bray is appointed Master Car-Builder for the Michigan Southern Division, vice Mr. S. S. Knapp, resigned. Office and shops at Adrian, Mich. Mr. W. O. Smith is appointed Master Car-Builder for the Toledo Division, vice Mr. F. O. Bray, transferred. Office and shops at Norwalk, Ohio. Appointments to take effect Sept. 10, 1877.

**Lehigh Valley.**—Mr. E. B. Byington has been appointed General Northern Passenger Agent, with office in Buffalo, N. Y.

**Michigan Central.**—Mr. Alexander McKay has been appointed Assistant General Freight Agent. He has been for several years Chicago agent of the Erie & North Shore Line.

**Ontario Southern.**—Mr. Charles J. Pusey has been appointed General Manager. He has been General Freight and Passenger Agent for some time.

**Quincy, Alton & St. Louis.**—At the annual meeting in Quincy, Ill., Sept. 5, the following directors were chosen: J. M. Walker, L. O. Goddard, A. A. Arnold, C. H. Hudson, N. D. Munson, R. M. Miles, H. W. Mead, F. O. Read. The directors subsequently elected J. M. Walker President and L. O. Goddard Secretary. The road is leased to the Chicago, Burlington & Quincy.

**Southwestern Railroad Rate Association.**—At the monthly meeting in St. Louis last week the following Executive Committee was chosen for the ensuing year: Hugh Riddle, Chicago, Rock Island & Pacific; A. A. Tammage, Missouri Pacific; J. C. McMullen, Chicago & Alton. Mr. Riddle is Chairman.

### PERSONAL.

—John Patterson, formerly President of the Blue Ridge Railroad Company, and now United States Senator from South Carolina, is to be tried on charges of conspiracy and bribery in

securing the passage of a bill giving the endorsement of that State to \$4,000,000 Blue Ridge bonds.

—Mr. George C. Fisk, President of the Wason Manufacturing Company, of Springfield, Mass., completed on Sept. 8 the twenty-fifth year of his connection with the concern. He entered the office as clerk Sept. 8, 1852, became a partner in the firm of T. W. Wason & Co. in December, 1854, and when the present company was formed in February, 1862, he was chosen Secretary. He became Vice-President in 1869 and President in 1871. Mr. Fisk also owns the Brightwood Paper Mill, at Hinsdale, N. H., and has an interest in a soap factory in Springfield.

—Superintendent W. J. Sewell, of the West Jersey Railroad, has been appointed Brigadier General of the Second Brigade, New Jersey State Militia. Gen. Sewell served in the late war and has for some time been colonel of one of the regiments of the Second Brigade. He commanded the brigade when called out during the recent strikes.

—Mr. C. S. Groff having resigned his position as General Agent for the Wabash Railway at Quincy, Ill., a large number of the business men of Quincy have prepared a petition asking the company to try and arrange with Mr. Groff for his return to the position.

### TRAFFIC AND EARNINGS.

#### Railroad Earnings.

Earnings for various periods are reported as follows:

Eight months ending Aug. 31:	1877.	1876.	Inc. or Dec.	P. c.
Atchison, Topeka & Santa Fe.....	\$1,478,987	\$1,476,303	Inc..	\$2,784 0.2
Bur., Cedar Rapids & Northern.....	615,583	740,434	Dec..	124,851 16.9
Chicago & Alton.....	2,820,923	3,161,167	Dec..	340,243 10.8
Illinois Central, Ill. lines.....	3,058,095	3,550,335	Dec..	492,240 13.9
International & Great Northern.....	802,381	725,058	Inc..	136,423 18.8
Missouri Pacific.....	2,425,888	2,310,917	Inc..	114,971 5.0
Missouri, Kansas & Texas.....	2,007,405	1,936,508	Inc..	70,898 3.7
Paducah & Memphis.....	119,823	134,798	Dec..	14,975 11.0
St. L., Alton & T. H., Belleville Line.....	315,675	300,201	Inc..	15,474 5.1
St. Louis, Kansas City & Northern.....	1,906,363	1,973,357	Dec..	67,005 3.4
St. Louis & San Francisco.....	830,046	814,264	Inc..	15,782 1.9
Toledo, Peoria & Warsaw.....	694,137	929,695	Dec..	235,468 25.3
Wabash.....	2,748,236	2,780,186	Dec..	31,950 1.1
Seven months ending July 31:				
Hannibal & St. Joseph.....	\$1,087,889	\$1,042,789	Inc..	\$15,100 1.4
Louisville & Nashville.....	2,948,176	2,761,913	Inc..	186,263 6.7
Union Pacific.....	6,987,406	6,624,714	Inc..	362,692 5.6
Month of July:				
Hannibal & St. Joseph.....	\$129,781	\$138,087	Dec..	\$8,307 6.0
Union Pacific.....	994,907	978,781	Inc..	16,216 1.7
Month of August:				
Atchison, Topeka & Santa Fe.....	\$255,174	\$231,549	Inc..	\$23,625 10.2
Bur., Cedar Rapids & Northern.....	42,618	77,951	Dec..	35,333 45.3
Chicago & Alton.....	483,266	510,796	Dec..	27,530 5.4
Illinois Central, Ill. lines.....	508,976	489,674	Inc..	19,302 3.9
International & Great Northern.....	115,900	86,251	Inc..	29,649 34.4
Missouri Pacific.....	351,396	306,075	Inc..	44,721 14.6
Missouri, Kansas & Texas.....	323,347	294,360	Inc..	28,987 9.8
Paducah & Memphis.....	17,937	16,703	Inc..	3,234 14.2
St. L., Alton & T. H., Belleville Line.....	46,244	35,113	Inc..	11,131 31.7
St. Louis, Kan. City & Northern.....	309,026	255,688	Inc..	46,338 18.1
St. Louis & San Francisco.....	121,080	114,307	Inc..	6,773 5.9
Toledo, Peoria & Warsaw.....	121,274	143,554	Dec..	22,280 15.5
Wabash.....	488,726	422,080	Inc..	66,646 15.8
Week ending Aug. 31:				
Great Western of Canada.....	\$77,009	\$77,347	Dec..	\$338 0.4
Week ending Sept. 1:				
Grand Trunk.....	\$190,050	\$181,809	Inc..	\$8,181 4.5

Month of July:	1877.	1876.	Inc. or Dec.	P. c.
Atchison, Topeka & Santa Fe.....	\$255,174	\$231,549	Inc..	\$23,625 10.2
Bur., Cedar Rapids & Northern.....	42,618	77,951	Dec..	35,333 45.3
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Week ending Sept. 1:				
Grand Trunk.....	\$190,050	\$181,809	Inc..	\$8,181 4.5

**Coal Movement.**  
Coal tonnages for the eight months ending Sept. 1 are reported as follows, the tonnage in each case being only that originating on the line to which it is credited:

Anthracite:	1877.	1876.	Inc. or Dec.	P. c.
Philadelphia & Reading.....	\$1,765,661	2,631,802	Inc..	1,544,690 88.7
Northern Central, from Shamokin Div. and Summit Branch.....	401,721	512,725	Dec..	111,004 21.7
Central of N. J., Lehigh Div.....	1,791,253	1,570,176	Inc..	221,077 14.1
Danville, Hazleton & Wilkesbarre.....	13,719	28,479	Dec..	14,760 51.8
Pennsylvania Canal.....	226,093	239,246	Dec..	13,153 5.5
Lehigh Valley.....	2,552,150	2,184,160	Inc..	367,990 16.8
Pennsylvania & N. Y. Delaware, Lackawanna & Western.....	32,931	17,488	Inc..	15,443 88.3
Delaware & Hudson Canal Co.....	1,311,352	944,613	Inc..	366,739 38.8
Delaware & Hudson Canal Co.....	1,283,899	1,149,947	Inc..	133,952 11.6
Pennsylvania Coal Co.....	700,902	623,388	Inc..	77,514 12.4
State Line & Sullivan.....	8,982	27,599	Dec..	18,617 67.5
Total anthracite.....	12,499,563	9,929,704	Inc..	2,569,859 25.9
Semi-bituminous:				
Cumberland, all lines.....	911,855	1,132,687	Dec..	220,832 19.5
Huntingdon & Broad Top.....	92,671	112,518	Dec..	9,847 9.6
Tyrone & Clearfield.....	801,916	797,381	Inc..	44,535 11.8
Total semi-bituminous.....	1,806,442	2,033,086	Dec..	130,644 6.7
Bituminous:				
Barclay.....	215,029	213,441	Inc..	1,588 0.7

The coal tonnage of the Belvidere Division, Pennsylvania Railroad, for the eight months ending Sept. 1, was:

	1877.	1876.	Inc. or Dec.	P. c.
Coal Port for shipment.....	13,544	163,550	Dec..	151,006 92.3
South Amboy for shipment.....	366,554	291,562	Inc..	74,992 25.7
Local distribution on New Jersey lines.....	114,573	101,538	Inc..	13,035 12.8
Company's use on New Jersey lines.....	45,669	40,334	Inc..	5,335 13.2
Totals.....	539,340	596,984	Dec..	57,644 9.7

The total this year included 396,728 tons from the Lehigh and 142,612 tons from the Wyoming region.

The Cumberland region is now generally at work, but the strike in the gas coal region in Western Pennsylvania continues and there has also been a partial strike in the Clearfield region. The anthracite trade is in a very unsettled condition, and just now the Reading is apparently master of the situation, being the only company whose miners are generally at work. A considerable increase in prices at tide-water is reported.

A deputation from the striking miners had an interview with President Sloan, of the Delaware, Lackawanna & Western, in New York, Sept. 6. Mr. Sloan said that the company would



not treat with the men as long as the strike continued, but if they returned to work the company would negotiate on the basis of an increase whenever the price of coal would warrant it, or on the basis of a sliding scale of wages to vary with the price of coal. The demand of the men is for an increase of 25 per cent. over present rates.

Latest reports are that some of the Lehigh & Wilkesbarre Company's mines have agreed to resume work.

#### Grain Movement.

For the eight months from Jan. 1 to Sept. 1, receipts and shipments have been, flour in barrels and grain in bushels:

Flour:	1877.	1876.	Inc. or Dec.	P. c.
Lake ports' receipts.....	2,618,388	3,408,402	Dec..	730,014 21.5
" shipments.....	2,646,547	2,647,732	Dec..	1,185 ...
Atlantic ports receipts.....	4,419,189	6,054,111	Dec..	1,634,922 27.0
Wheat:				
Lake ports' receipts.....	17,264,501	30,873,048	Dec..	13,608,547 44.0
" shipments.....	15,108,816	29,048,979	Dec..	13,940,163 48.1
Atlantic ports' receipts.....	11,690,864	28,850,876	Dec..	17,160,012 59.5
Corn:				
Lake ports' receipts.....	55,982,690	54,527,737	Inc..	1,454,953 2.7
" shipments.....	50,231,437	49,803,008	Inc..	428,429 0.8
Atlantic ports' receipts.....	57,940,553	58,890,723	Dec..	950,160 1.6
Grain of all kinds:				
Lake ports' receipts.....	91,598,707	106,313,878	Dec..	14,715,171 13.8
" shipments.....	78,740,979	95,247,917	Dec..	16,506,938 17.4
Atlantic ports' receipts.....	84,524,215	106,357,508	Dec..	21,833,293 20.5

For five years the totals of all grains have been:

	1877.	1876.	1875.	1874.	1873.
Lake ports' receipts.....	91,598,707	106,313,878	90,082,109	119,968,509	107,614,854
Lake ports' shipments.....	78,740,979	95,247,917	73,182,444	90,924,441	87,098,035
Atlantic ports' receipts.....	84,524,215	106,357,508	79,699,086	96,478,868	94,043,765

This year's movement is thus the lightest of the five years, except that of 1875, which was still lighter.

Receipts and shipments for the week ending Sept. 1 were, in bushels:

	1877.	1876.	Increase.	P. c.
Lake ports' receipts.....	4,985,532	4,832,385	153,147	3.2
" shipments.....	4,710,569	3,271,549	1,439,020	44.0
Atlantic ports' receipts.....	4,846,140	3,371,266	1,474,874	43.7

The receipts of wheat at lake ports are especially large this week, for the first time in many months being greater than corn receipts. The shipments of these ports were 24 1/4 per cent. by rail this year, 48 1/4 in 1876, 30 1/4 in 1875, and 32 1/4 in 1874. The percentage of receipts at each Atlantic port was: New York, 53.1; Montreal, 14.9; Baltimore, 14.5; Philadelphia, 9.8; Boston, 7.1; New Orleans, 0.4; Portland, 0.2.

Chicago receipts and shipments for the week ending Sept. 8 were:

	1877.	1876.	Increase.	P. c.
Receipts.....	2,307,315	2,226,737	80,578	6.0
Shipments.....	2,787,445	2,414,647	372,798	15.4

#### Petroleum Movement.

Stowell's Petroleum Reporter gives the product of crude petroleum from the Pennsylvania oil regions for July at 1,189,005 barrels; shipments, 1,096,951 barrels. Of this production no less than 759,562 barrels were from the Butler and Clarion districts.

#### Delaware Fruit Traffic.

The total shipments of peaches north over the Delaware Railroad up to Sept. 8 were 4,145 car-loads. The business is nearly over for this season and the shipments are now rapidly decreasing.

#### Iron Ore Movement.

Shipments of iron ore from the Lake Superior region up to Aug. 29 were as follows:

	1877.	1876.	Inc. or Dec.	P. c.
From Marquette, tons.....	381,990	321,024	Inc..	60,966 19.0
From L'Anse.....	47,508	57,819	Dec..	10,311 17.8
From Escanaba.....	264,703	245,090	Inc..	19,604 8.0
Totals.....	694,207	623,942	Inc..	70,265 11.3

From Marquette this year there were shipped also 7,888 tons of pig iron.

#### THE SCRAP HEAP.

#### Railroad Manufactures.

The National Tube Works, at McKeesport, Pa., have been making some boiler tubes 15 in. diameter and 90 ft. long. They have been tested up to a pressure of 600 lbs. per square inch. They are for a steamboat now building at Louisville. They lately made some tubes 12 in. diameter and 36 ft. long for a rolling mill at Youngstown, O.

Mr. John L. Gill, Jr., has been building at his car-wheel works at Pittsburgh a testing machine having a capacity of 100,000 pounds. It is for his own use.

The Richards chain train brake is now being tried on the Naugatuck Railroad in Connecticut.

The rolling mill at Rockaway, Morris County, N. J., is being repaired and put in order and will, it is said, soon be started up.

The American Bridge Co., of Chicago, is building the temporary bridge which is to replace the two spans lately destroyed in the Union Pacific bridge over the Missouri at Omaha.

The Etna Rolling Mill, at Bridgeport, O., is again in full operation.

C. A. & W. L. Teal, of Philadelphia, have designed and are making a new style of post drilling machine intended especially for use in boiler shops.

Rieble Brothers, of Philadelphia, have recently shipped an 80,000-lb. track scale for the Lehigh Valley Railroad; a scale of the same capacity for the Birdsboro Rolling Mill; a number of platform scales to the Philadelphia & Atlantic City road, and a wire-testing machine to San Francisco.

The Eureka Steel Works, at Lamokin Pa., were to start up this week.

The Pittsburgh Manufacturer says: "Mr. Wilcox (of Wilcox, Shinkle & Miller) and Mr. Henry King, both of this city, have purchased the Alliance (Ohio) Rolling Mill, paying therefor \$9,200. The mill was built only a few years ago at a cost, it is said, of \$214,000."

The Mt. Savage Furnace Co. is building at Mt. Savage, Md., a blast furnace to make iron from cinder. It will have a capacity of 20 tons per day and replaces a smaller one.

Reese, Graft & Woods, at Pittsburgh, are running night and day on a large order for bridge iron from the American Bridge Co.

Extensive repairs and improvements are being made at the Norton Iron Works at Ashland, Ky.

It is said that the rolling mill of the Milwaukee Iron Co., at Milwaukee Wis., will soon be started up.

The Lake Shore Foundry, at Cleveland, O., is making a number of cast iron pipes, six feet interior diameter and 1 1/2 in. thick to be used as culverts or water-ways under a railroad embankment. They are for a road in Michigan.

The Vulcan Iron Works, of St. Louis, have a contract for steel rails for the Hannibal & St. Joseph road.

The Canadian Engine & Machinery Works, at Kingston, Ont., lately received a contract for some locomotives for the Intercolonial Railway.

The Toronto (Ont.) Monetary Times says: "Wicks' refrigerator cars were pretty well tested during the latter part of

August. One of the cars running regularly on the Grand Trunk was loaded with fresh beef at Toronto, and was shipped from there to Chicago over the Grand Trunk and Michigan Central railways; and at Chicago it was reshipped to Boston without being opened, over the Michigan Central, Grand Trunk and Central Vermont railways, making a distance of 1,700 miles, in seven days and fifteen hours. The car received on the way 1 1/2 tons of ice at Chicago, and one ton at Montreal, and had remaining in it on arrival at Boston 1 1/2 tons of ice. The beef arrived at its destination in excellent order."

The Wason Manufacturing Co., at Brightwood, Mass., has an order for 1,500 car wheels for the Grand Trunk and is building a lot of hay cars for another road.

The Tiffany Refrigerator Car Co. last week leased six of its cars in one lot to be used in the California trade.

#### The Bosphorus Bridge.

Capt. James B. Eads writes to the St. Louis Republican as follows:

"Please permit me to correct the statement recently published in a number of the principal newspapers in the United States, to the effect that I am about to undertake the construction of a bridge across the Bosphorus, to unite Europe and Asia.

"When in Constantinople, three years ago, I was requested by the Grand Vizier to furnish the Ottoman government with plans and estimates of the cost of such a bridge. These were prepared and forwarded about two and a half years ago, but as a change of ministers occurred soon after in that government and the grant to improve the mouth of the Mississippi was passed by Congress, the subject has received no further attention from me.

"A description of the plans of the bridge having been recently communicated to the New York Times by the engineer (Mr. Lambert), whom I had engaged to assist me in their preparation, has caused the very general impression that I am actually about to undertake its construction."

#### Fast Time.

The Utica Herald of Sept. 7 says: "At 7:37 a. m., yesterday, President W. H. Vanderbilt's special train left Syracuse, drawn by engine No. 280, Reuben Allen, engineer. President Vanderbilt was accompanied by Senator Wagner, General Priest, Hon. Chauncey M. Depew and others. The run was made as follows: Amsterdam, 8:04; Fonda, 8:15; St. Johnsville, 8:40; Little Falls, 8:50; Utica, 9:11; left Utica 9:15; Rome, 9:30; Oneida, 9:43; arrived in Syracuse 10:11 a. m. The run between Utica and Syracuse, 53 miles, was made in 50 minutes, and the whole run, 130 1/2 miles, in 144 minutes, deducting stops. Returning, the train left Syracuse at 2:37; Manlius, 3:11; Oneida, 3:29; Rome, 3:43; reached Utica, 3:59; left 4:02; Little Falls, 4:06; St. Johnsville, 4:37; Fonda, 5:04 1/2; Amsterdam, 5:16; and Schenectady 5:35."

The engineer of the train was subsequently arrested in Syracuse for running into that city at a speed much greater than that allowed by the city ordinances.

#### A Young Telegraph Operator.

The Oayka (Miss.) News says: "During the recent illness of Mr. Carey, the telegraph operator at Martinsville, on the Jackson Railroad, the office was managed entirely by Miss Mollie Short, who is only ten years of age. She sent messages and trains, and received orders for conductors from the train dispatcher's office in a very creditable manner."

#### A Royal Palace Car.

The Wilmington (Del.) Republican of Sept. 8 says: "The Jackson & Sharp company have just finished a narrow-gauge railroad car for King Oscar of Norway and Sweden, which for beauty and convenience is unequalled, even by the one recently built by the same firm for Dom Pedro, of Brazil, and exhibited at the Centennial. The car is built low to suit the numerous tunnels which occur among the mountain cliffs for which that country is noted, and is divided into three compartments.

"The smaller compartment is used for a toilet room and also contains the heating apparatus. It is elaborately finished and furnished with every convenience which would contribute to hygienic requirements and comfort of the royal family.

"At the opposite end of the car is a large compartment for the King and his suite. It is finished in princely style with chairs upholstered with plush.

"The middle and large compartment, is the parlor and royal rooms, furnished with sofas, chairs, lounges and very finely finished tables. The upholstery is of sage green silk tapestry, and is undoubtedly among the finest specimens of workmanship ever sent out from this city. The woods of which the interior is finished are maple, walnut and satin wood veneering, to which a very brilliant polish is imparted by the most skillful artisans. The violet predominates in the various shades in which the ceiling is finished, and is in perfect harmony with the velvety Brussels which covers the floor.

"Upon the paneling on the outside the coat of arms of Norway is artistically painted. It is represented by a guard-shield of purple red, with a lion standing upright with a drawn halberd in his fore paw. The lion is finished in gold, and the blade of the halberd is painted in a steel color. The whole is surmounted by a crown finished in purple and gold. Upon each side of the car is painted the name 'Hamar-Thronbjørn Jernbane,' which, we are informed, means Hamar-Thronbjørn Railway, the former being a town in Eastern Norway, and the latter a town in Northern Norway. The finest plate glass is used, and that used in the inside doors is very chastely engraved.

"The car has been carefully taken to pieces in sections, its respective parts carefully boxed up and put aboard the Electric line of steamers, which started this morning for New York. At that city the car will be transferred to the steamer 'Seuria,' of the Hamburg American Packet Company, and on the 13th inst. it will start for its destination."

#### OLD AND NEW ROADS.

#### Ashley River.

This road has been under contract for some time and the grading is now well advanced, and tracklaying has been begun. The principal work is the bridge over the Ashley River at Bee's Ferry, on which work is now in progress. The road is to connect the Northeastern and the Savannah & Charleston roads outside of Charleston and to give the last-named road an entrance into the city on the Northeastern track. It will be about eight miles long, leaving the Northeastern at a point seven miles from the Charleston depot and joining the Savannah & Charleston at John's Island Ferry.

#### Atlantic & Pacific Telegraph.

A suit has been begun in the New York Supreme Court by a stockholder in this company to enjoin the execution of the recent pooling contract with the Western Union, on the ground that, if carried into effect, it will be injurious to the interests of the stockholders.

#### Burlington, Cedar Rapids & Northern.

The extension of the Pacific Division is now completed to Grundy Centre, the county seat of Grundy County, Ia., which is 45 miles west by north from the junction with the main line at Vinton, and nine miles beyond Rhinebeck, the last point noted. The opening of the line was celebrated Sept. 5 by an

excursion, with a public meeting and collation at Grundy Centre, and trains now run regularly to the new terminus.

#### Boston, Revere Beach & Lynn.

The stockholders have voted to authorize the execution of a mortgage upon the road for \$350,000, for the purpose of funding all the existing liabilities of the company. An issue of \$175,000 for the same purpose was voted about a year ago. The present debt, funded and floating, is stated at \$230,120.

#### Brasos & Colorado.

This company has agreed to build its projected line from Columbia, Tex., to Wharton, on the Colorado River, provided the people on the line will donate 25,000 acres of land or its equivalent in money. Subscriptions amounting to 22,000 acres have been secured, leaving 3,000 still needed.

#### Buffalo, New York & Erie.

Mr. John A. C. Gray, Trustee, gives notice that he will pay off during the month of September, at the office of the Union Trust Company in New York, \$300,000 of the old first-mortgage bonds which will mature Dec. 1, 1877. This is in addition to the amount paid off and canceled in August.

#### Cazenovia, Canastota & De Ruyter.

Local papers state that grading has been begun on the extension of this road from Cazenovia, N. Y., southward 14 miles to De Ruyter, where a connection will be made with the Utica, Ithaca & Elmira road.

#### Chicago, Burlington & Quincy.

The company has largely increased the force at the Aurora shops, which are now full of work. An order has been given for the immediate construction of 200 new freight cars, which will be turned out at the rate of about four per day.

#### Chicago & Eastern Illinois.

The following circular is dated Sept. 1: "The property and appurtenances of the late Chicago, Danville & Vincennes Railroad having been duly vested in this company, the property will, on and after this date, be operated by the Chicago & Eastern Illinois Railroad Company under which name all accounts should be hereafter stated and reported."

#### Columbus & Toledo.

This company has nearly completed at Toledo, O., a new dock 1,000 feet long for its own use. It is intended chiefly for the transfer of coal, iron ore and iron between the boats and cars and is provided with two elevators having a capacity of 600 tons of coal per day. There are also facilities for handling lumber.

#### Covington, Columbus & Black Hills.

A dispatch from Davenport, Ia., Sept. 7, says: "There has been pending before Judge Dillon for several days an application for the appointment of a receiver and an injunction against the Covington, Columbus & Black Hills Railroad Company and others, at the suit of James B. Hubbell, of Minnesota, and upon the cross-bill of H. D. Boyd, of Sioux City. The Court denied the application for a receiver, but decided to enjoin the company from disposing of any of its property, or encumbering the road already built, and required the defendants to account for the proceeds of the Ferry & Transfer Company's effects. This order is to protect the property of said company from spoliation, to prevent the disposal thereof, and to ascertain more fully whether the present managers of the company are operating in good faith to construct the road as represented, or have means to fulfill their contracts. Should they fail in this, the Court held that the application for a receiver might again be heard."

#### Covington, Flemingsburg & Pound Gap.

The Court has authorized the Receiver to lay the track on the road-bed now graded from the present terminus at Flemingsburg, Ky., eastward to Hillsboro, about 10 miles. The road is now in operation from Flemingsburg westward to Johnson on the Maysville & Lexington road, about six miles. The road was put in the hands of a receiver some time since on the application of the creditors, the contractors who undertook its completion having failed to carry out their contract and left a considerable floating debt.

#### Dividends.

Dividends have been declared as follows:

New York Central & Hudson River, 2 per cent., quarterly, payable Oct. 15.  
Lehigh Valley, 1 per cent., quarterly, payable to ladies only Oct. 13; to all others, Oct. 15.  
Utica & Black River, 3 per cent., semi-annual, payable Sept. 26.  
Western Union Telegraph, 1 1/4 per cent., quarterly, payable Oct. 15.

#### Darien Branch.

It is proposed to build a railroad from the seaport of Darien, Ga., north by west to Walthourville on the Atlantic & Gulf road, about 33 miles. Darien has a good harbor but little trade, though the branch might furnish some traffic in lumber and naval stores.

#### Dayton & Southeastern.

The track on this narrow-gauge road is now laid to Frankfort, O., 66 miles southeast from Dayton, and 18 1/2 miles beyond the late terminus at Washington Court House. Construction trains now run through and regular trains will be put on to Frankfort about Sept. 18. A meeting was held at Frankfort last week to locate the crossing of the Marietta & Cincinnati near that place.

#### Duxbury & Cohasset.

The towns of Duxbury and Marshfield have accepted the recommendation of the Railroad Commissioners and voted to sell their stock in this road to the Old Colony Company, the value to be appraised by the Commissioners. It is thought that the other towns interested will do the same.

#### Eastport & Aroostook Valley.

The town of Eastport, Me., has voted a 5 per cent. tax in aid of this projected road, which is to connect Eastport with the St. Croix & Penobscot road at Baring, and is to run thence northward to a point not yet decided on.

#### European & North American.

The equipment having been prepared as far as possible, the change of gauge from 5 ft. 6 in. to 4 ft. 8 1/2 in. on this road will be begun Sept. 17. By agreement between the Receivers of the New Brunswick section and the Trustees in possession of the Maine section, the change will be made on the whole line at the same time. All possible preliminary work will be done beforehand, so that the change can be completed in the shortest possible time. The through express trains will not be interrupted, but there will be a partial suspension of freight traffic, and no freight will be moved for connecting lines from Sept. 12 to Sept. 17; there will also be some disarrangement of local trains. The whole length of line to be changed is 205 miles, from Bangor, Me., to St. John, N. B. The change was decided on several years ago, but has been postponed on account of the financial troubles of the company.

#### East Tennessee & Western North Carolina.

This unfinished road was purchased several years ago by Mr. Pardee, of Philadelphia, who also bought about the same time the Cranberry iron property in Carter County, Tenn., near the North Carolina line. Lately these parties have begun a survey of that part of the line which is not graded, and it is said that the road will be completed from the junction with



the East Tennessee, Virginia & Georgia road at Johnson City, west to the Cranberry ore bed. The distance is about 23 miles, about half of which is graded.

#### Foreclosure Sales.

Sales of railroad property under legal process are noted as follows:

**North & South, of Georgia,** in Columbus, Ga., Sept. 4, to satisfy the State lien for interest on endorsed bonds. Bought for \$40,500, by the Columbus & Atlanta Air Line Railroad Company, a corporation organized to buy and extend the road. It is in operation from Columbus, Ga., to Hamilton, 23 miles, and some work has been done beyond that point; it is of 3 ft. gauge.

**Buffalo & Jamestown,** at Buffalo, Sept. 11, under a decree of foreclosure granted by the New York Supreme Court. Bought for \$1,000,000 by J. M. Richmond, W. H. H. Newman, Abram Altman, John F. Moulton and W. S. Bissell, acting as a committee for the bondholders. The road is 68½ miles long, from Buffalo to a connection with the Atlantic & Great Western at Jamestown, N. Y., and had a funded debt of \$1,125,500. It was originally projected as an oil road at the time of the South Improvement Company excitement, and was to connect with a line to Titusville, but the company organized to build the Pennsylvania end of the line failed to do anything. The city of Buffalo owns \$1,000,000 stock in the company and several towns on the line issued bonds in aid of it, some of which bonds are now in litigation.

#### Freehold & New York.

This company has begun to run regular trains over the completed section of its road from Freehold, N. J., to Matawan. At the latter place connections for New York are made with the Long Branch Division of the New Jersey Central.

#### Hannibal & St. Joseph.

The application for the appointment of a receiver made by certain stockholders came up Sept. 3 and was put over to Sept. 24 at the request of counsel for the plaintiffs.

#### Harlem Extension.

Mr. M. H. Bloodgood, who represents the bondholders who have possession of that portion of the road between Bennington, Vt., and Chatham Four Corners, N. Y., the old Lebanon Springs road, has written a letter stating that the road is in very poor condition and has no equipment. To put it in such condition as to enable trains to be run safely will require at least \$25,000, and equipment must be hired for the present. But, under present circumstances, the road can hardly earn its running expenses and the towns through which it passes have assessed it at an extravagant valuation, so that it is pretty certain that the taxes would exceed the net earnings. Under these circumstances the bondholders will not feel justified in attempting to operate the road unless the assessments upon it can be generally reduced, as they are not prepared to advance money for the privilege of working the road, with no hope of profit.

The northern section of the road, from Rutland, Vt., to Bennington, was finally transferred on Sept. 10 to the new Bennington & Rutland Railroad Company, which will hereafter operate it. Connections south of Bennington will be made over the Troy & Boston road at present.

#### Hoosac Tunnel & Southeastern.

This is the name given to a new line which it is proposed to build to connect Boston with the Hoosac Tunnel by way of the New York and New England road. The line is to leave the Troy & Greenfield road in Deerfield, cross the Connecticut in Sunderland and run through Amherst, Enfield and Ware to West Brookfield, where it will cross the Boston & Albany and continue on through Sturbridge to Southbridge, where it will connect with the Southbridge Branch of the New York & New England. The distance from Deerfield to Southbridge is about 45 miles; the distance from Boston to the tunnel by this route would be nearly 10 miles more than by the Fitchburg road, but it is claimed that much better grades can be secured, and that the New York & New England can reach the South Boston flats and secure terminal facilities there more readily than the Fitchburg Company.

#### Indianapolis & Sandusky.

A company by this name has been organized to build a railroad from Indianapolis east by north to a point in Randolph County, Ind., on the Ohio State line, about 80 miles. It is intended to be a branch of the Lake Erie & Louisville road, and the incorporators are nearly all connected with that company.

#### Iowa Pacific.

It is reported that the Chicago, Dubuque & Minnesota is negotiating for a controlling interest in this road. If the negotiation is successful the Iowa Pacific will probably be completed and put in operation.

#### Kansas Central.

Work is now progressing on the extension of this road from the old terminus at Holton, Kan., westward into the valley of the Vermillion River. The grading is well advanced and the company hopes to have 20 miles of new track completed before cold weather.

#### Lake Erie & Louisville.

It is reported that this company has completed arrangements to build the proposed extension from St. Mary's, O., west by south through New Bremen, Munster and Celina to Muncie, Ind. The distance is 61 miles.

#### Little River Valley & Arkansas.

This narrow-gauge road is now graded from New Madrid, Mo., on the Mississippi River, west by south 30 miles, and the company recently concluded contracts in St. Louis for the rails and fastenings for this 30 miles and for two locomotives and 30 cars. The road will run through a heavily wooded country but little settled.

Commenting upon this news the St. Louis Republican says: "The Little River Valley & Arkansas Narrow-Gauge Railway, projected to run from Madrid in Southeast Missouri indefinitely to the west and southwest, is supposed to be the road made famous by Col. Mulberry Sellers. At last, however, the Sellers' trunk line seems to have gotten on its right legs."

#### Mammoth Cave Branch.

It is said that arrangements have been completed for the construction of this branch, which is to run from Glasgow Junction, Ky., on the Louisville & Nashville road, west by north to the famous Mammoth Cave, a distance of about 15 miles.

#### Memphis & Charleston.

The Knoxville (Tenn.) Tribune of Sept. 1 says: "It was announced a month or two ago that the East Tennessee, Virginia & Georgia Railroad Company had negotiated a conditional lease of the Memphis & Charleston Railroad. One of the conditions of said lease—and the principal one—was that, by the 1st of September, the indebtedness of the Memphis & Charleston road to the State of Tennessee should be so discharged as to reduce the annual interest account of the company from \$360,000 to \$310,000 as a maximum. This condition, and all others, having now been fully complied with, the lease becomes effective to-day, and the unification of the line from Bristol to Memphis, under the proprietorship and management of the East Tennessee, Virginia & Georgia Company, is therefore complete.

"The financial operations necessary to a complete with the preliminary terms of the lease have been accomplished, we are pleased to learn, without cost or increased liability to the East Tennessee, Virginia & Georgia Company. The principal of the indebtedness of the Memphis & Charleston Company

has been reduced \$1,030,000, and its annual interest account brought down to \$304,000, being \$6,000 less than the maximum agreed upon."

It is not probable that there will be any considerable change in management, as both roads have been for some time controlled by the same parties and have had very nearly the same general officers. The lease will probably effect some economy in management.

#### Michigan Central.

The following order, directed to "heads of departments," from General Manager Ledyard is dated Sept. 1:

"I desire to call your attention to the necessity of decreasing the amount of work on Sunday which our employees are called upon to perform. Much of this work can be dispensed with. Our employees should, as far as possible, be enabled to rest on Sunday. Each head of department will be expected to so regulate the work of his department that no work shall be done on that day except such as is absolutely necessary. Division superintendents and train-masters will, when practicable, arrange the runs of their men so that they can be home on Sunday."

#### New Brunswick.

The St. John (N. B.) Telegraph of Sept. 7 says of this road: "A locomotive crossed the Aroostook bridge on the 4th inst. The grading is nearly all done on the road to the Grand Falls, with the exception of two cuttings, which it is supposed will take six weeks to complete. By the time these are finished the ballasting will be nearly done. Probably a mile of track above the Aroostook is laid. Ballast is abundant, and the rails will probably be laid to the Falls by the middle of October."

From the Aroostook Crossing to the Grand Falls the distance is about 20 miles, the line being nearly due north, parallel to and six or eight miles distant from the boundary line between New Brunswick and Maine. From the Grand Falls the line will turn northwest and follow up the St. John to the mouth of the Madawaska, then up that river and by Lake Temiscouata to Riviere du Loup. The Grand Falls will probably be the terminus for next winter.

#### New Brunswick & Canada.

Arrangements are being made to change the gauge of this road from 5 ft. 6 in. to 4 ft. 8½ in. The change is made necessary by that of the European & North America, its chief rail connection.

#### New Castle & Franklin.

This company has surveyed and located an extension of four or five miles from New Castle, Pa., to Mahoningtown for the purpose of connecting with the proposed Pittsburgh & Lake Erie road. Its construction probably depends entirely upon the building of the Pittsburgh road.

#### New York & Oswego Midland.

The latest plan for the utilization of this road comes from Boston, and is thus set forth by the Boston Herald in an article on the Hoosac Tunnel and its connections: "A combination of New York and English capitalists propose to unite with the bondholders of the New York & Oswego Midland Railroad, who will purchase the railroad; then putting the railroad in complete order, they propose to finish the Buffalo Branch of the New York & Oswego Midland Railroad. This will give a new, short and low-graded railroad east from Buffalo to within a few miles of Utica. A short link from Utica west will unite us with the Buffalo Branch, and surveys show that following the short, direct route via Schenectady and the Tunnel, the distance via this route will be 40 miles less between Buffalo and Boston than via the present New York Central and Boston & Albany Railroad route; the distance from Buffalo to Chicago via the shortest route will be 490 miles, Buffalo to Boston 460 miles, making the distance from Boston to Chicago 950 miles. The English capitalists interested in this New York & Oswego Midland movement are extensive owners of the Great Western Railroad, the Grand Trunk Railroad and the Atlantic & Great Western Railroad, who are dissatisfied with the active part taken by the Vanderbilts in their rivals, the Lake Shore & Michigan Southern and Canada Southern railroads, to the great detriment of their own railroad. They hope thus to control a route to New York and New England independent of the New York Central. . . . "Heretofore this road (Atlantic & Great Western) has depended upon the Erie for its Eastern connections, and will welcome any other Eastern connection. One such is now nearly completed, the new road now being finished from Salamanca to Rochester, 108 miles. Salamanca is the eastern terminus of the Atlantic & Great Western Railroad. The Buffalo Branch of the New York & Oswego Midland Railroad will cross the Salamanca & Rochester Railroad 93 miles northeast of Salamanca, furnishing the Atlantic & Great Western Railroad its best connection with the tunnel and city of Boston. The movement of cotton over this route from the Southern States to our New England cotton factories, via Cincinnati, must be large in the future."

#### Ohio & Toledo.

A mortgage for \$1,000,000 has been executed by this company to Mr. Edward Livermore, of New York, as trustee. The company has no funded debt and owns a narrow-gauge line from Canonsburg, O., to Minerva, 22 miles. The bonds issued under the mortgage are to be used to pay off the floating debt and extend the road from Minerva to Youngstown, 43 miles.

#### Philadelphia & Atlantic City.

The Philadelphia Times of Sept. 12 says: "The maturing indebtedness of the Philadelphia & Atlantic City Railroad Company, amounting to \$200,000, has been extended over one, two and three years, with interest, by the consent of creditors."

#### Pennsylvania.

It is said that this company will shortly build an extension of its leased Bedford & Bridgeport road from its present terminus at the Maryland State line to Cumberland, about six miles. It now uses for that distance the tracks of the Cumberland & Piedmont road.

A dispatch from Pittsburgh, dated Sept. 11, says: "The Chamber of Commerce was electrified this afternoon by the intelligence that the freight discrimination against Pittsburgh, of which the merchants have long complained, is to be ended. James Parke, Jr., reported the result of a meeting between some business men and President Scott, and read a letter from him, which was highly encouraging. The meeting, as reported by Mr. Parke, was held because President Scott wanted to get a correct understanding of the matter. The discrimination was made plain to him, and he characterized it as perfectly outrageous, and gave assurance that Pittsburgh need no longer complain. He said that at no time in the future shall lower rates be charged for freight west of Pittsburgh than to this city; but that instead, under all circumstances, hereafter rates to Pittsburgh shall be 30 to 40 per cent. cheaper than to points beyond. President Scott also asked that in all cases where there is cause for complaint he be notified, and he will attend to the matter personally and see that the abuse is corrected. There was the greatest satisfaction expressed by the members of the chamber over the information, and it will be hailed by all business men in this city as the most joyous piece of news they have heard for many days."

The Pittsburgh Commercial Gazette of Sept. 11 says: "The plans prepared by the Pennsylvania Railroad officials in this city contemplate the building of only one round-house on the old site at the Twenty-eighth street crossing. A half round-house will be built at Thirty-third street on the site of the old

Denny mansion, burned during the riot. The transfer and sand houses will be rebuilt where they were before. The repair shops will probably be removed to East Liberty. The plans are now in the hands of President Scott and the directors at Philadelphia.

#### Pittsburgh, New Castle & Lake Erie.

Over 80 bids were received for the construction of the 30 miles of this road from Pittsburgh to Harmony, but the contract had not yet been awarded at latest accounts, the bids being still under consideration by the board. As soon as this section is disposed of contracts will be let for an additional section of 14 miles beyond Harmony.

#### Quebec, Montreal, Ottawa & Occidental.

Contractor McGreevy is pushing the work on the Quebec Division, the old North Shore road between Quebec and Montreal. The road is nearly completed to St. Bartholem, which is 110 miles southwest from Quebec and 70 miles beyond the late terminus at Port Neuf. The present end of the track is nearly opposite Sorel.

#### Rome, Watertown & Ogdensburg.

Since this company acquired possession of the Syracuse Northern road it has been operating six miles of that road, from Pulaski to Sandy Creek, which yields no local traffic and is not far from the main line. It is stated that arrangements have been made to abandon this six miles of road and to run the trains on the Syracuse Line upon the branch from Richland to Oswego at Pulaski, making the connection with the main line at Richland instead of Sandy Creek, and saving the expense of maintaining six miles of comparatively useless line. This decision, however, seems to have aroused a good deal of local feeling, although both Pulaski and Sandy Creek will have the same trains and connections as before, and there is no station between.

#### Savannah & Charleston.

Mr. C. T. Mitchell, Receiver, reports to the Court for the year ending July 31 as follows:

Receipts first quarter.....	\$89,805 63
" second quarter.....	87,161 76
" third quarter.....	75,121 96
" fourth quarter.....	82,694 18
Total.....	\$303,883 53
Disbursements first quarter.....	\$50,195 47
" second quarter.....	50,091 95
" third quarter.....	69,542 96
" fourth quarter.....	74,607 12
Total.....	283,837 50

Balance on hand July 31..... \$20,046 02

Each quarter of the year showed a surplus of receipts except the second, when the expenditures were the greatest.

#### Southbridge & Brookfield.

The proposed town subscription of \$60,000 in aid of this road was voted on in Southbridge, Mass., Sept. 8, and rejected, failing to receive the two-thirds vote required by law.

#### Southwestern Railroad Rate Association.

At the regular monthly meeting in St. Louis last week a plan for a more permanent organization was presented, including a clearing-house. The routine business of the meeting, however, occupied all the available time and the consideration of this plan was postponed until the next meeting, which will be held in Chicago, Sept. 26.

#### Schenectady & Hoosac Tunnel.

This is one of the latest projects for a western connection with the Hoosac Tunnel, and it is said that surveys have already been made. The line is from Schenectady, N. Y., nearly due west to Eagle Bridge, 30 miles, crossing the Hudson at Mechanicsville. At Eagle Bridge connection will be made with the Troy & Boston road and the track of that road used to North Adams. It is claimed that by this line the grades will be lower than by any of the existing or proposed lines west of the tunnel.

#### Springfield, Jackson & Pomeroy.

On the western end of this road track is now laid to South Charleston, O., 13 miles east by south from Springfield, and trains are running between the two places. Work is also in progress from Waverly westward.

#### St. Louis, Marine & Edwardsville.

The purchase of this road by the Wabash Company, reported last week, is confirmed. The purchase was made from the German Savings Institution, of St. Louis, which bought in the property under foreclosure two years ago, and the purpose is stated to have been chiefly to secure the line into the town of Edwardsville, which is over a mile from the Wabash track. The road is locally better known as the Madison County Railroad, and is eight miles long, from Edwardsville eastward to a junction with the Chicago & Alton.

#### Scioto Valley.

The tracklayers on the southern end of the extension from Chillicothe, O., to Portsmouth have reached a point 15 miles northward from Portsmouth. The grading and bridging are nearly all done and the tracklayers last week began work from Chillicothe southward.

#### Tennessee Central.

This road was nearly all graded several years ago from the Nashville, Chattanooga & St. Louis at Huntington, Tenn., westward 33 miles to the crossing of the Mobile & Ohio at Trenton in Gibson County, but no work has been done for some time. An effort is now being made to secure the money needed to complete the grading, build the bridges and furnish the ties. It is understood that, if this can be done, the Nashville, Chattanooga & St. Louis will furnish the iron and work the road.

#### Toledo, Peoria & Warsaw.

In the United States Circuit Court in Chicago, Sept. 4, a bill was filed by James F. Secor, Trustee, to foreclose the separate mortgage on the Burlington Branch. This mortgage was dated June 1, 1872, to secure an issue of \$250,000 bonds, and is a first lien on the 10 miles of road from La Harpe, Ill., to the junction with the Carthage Branch of the Chicago, Burlington & Quincy. The foreclosure of this mortgage is necessary to complete the reorganization of the road according to the proposed plan.

#### Ulster & Delaware.

It is said that this company is making arrangements to build a branch from its road to the Overlook Mountain House, for the purpose of accommodating the large summer travel into the Catskill Mountain region.

#### Utica & Black River.

The people of Ogdensburg, N. Y., having raised very nearly the amount required to pay for the right of way for the extension of this road from Morristown to Ogdensburg, the company has finally agreed to build the road, and work will be begun as soon as the necessary arrangements can be made. The distance is 12 miles, and the road will be built by a separate company, already organized as the Ogdensburg and Morristown Railroad Company, and leased to the Utica & Black River on its completion.

#### Valley, of Ohio.

It is stated that the English bondholders who bought the Marietta, Pittsburgh & Cleveland road have agreed to a con-



solidation with the Valley Railroad Company, which owns a partly graded line from Cleveland, O., to Canal Dover, but that the consent of the German bondholders is still to be obtained. The agreement provides that the owners of the Marietta road shall advance \$800,000 for the completion of the Valley Railroad.

#### Washington & Ohio.

A dispatch from Richmond, Va., Sept. 8, says: "The case of McComb and others against the Washington & Ohio Railroad Company asking for the appointment of a receiver, etc., which has been under argument for several days in the Circuit Court of Richmond, was concluded to-day. Judge Wellford decided that the affairs and management of the road remain in the hands of the officers and directors of the company, but subject to such restraining and directing orders from the Court as to giving bonds, making reports and depositing the receipts from month to month during the litigation, as the Court in its discretion, and for the preservation of the property, may determine."

#### Watchung.

This short branch of the Montclair & Greenwood Lake road is now run by Mr. F. C. O'Reilly, of Orange, N. J., who furnishes an engine and cars and makes no charge for passengers, expecting to be repaid by public subscription. It is proposed to extend the road to a better terminus in Orange, as soon as a permanent arrangement for working the road can be made.

#### Waynesville, Port William & Jeffersonville.

The grading on this road is so far advanced that the work of laying track was begun last week at Allentown, O., the crossing of the Dayton & Southeastern. The road is to extend from Waynesville, O., east by north to Jeffersonville, 30 miles, and is one section of the proposed narrow-gauge line from Cincinnati to Columbus.

#### Western, of Minnesota.

This company, which was organized to complete the Brainerd Branch of the St. Paul & Pacific under the terms of an act passed by the Minnesota Legislature last year, is making active progress with the work. The contract was let to De Graff & Co., of St. Paul, who graded the line some years ago, and the firm has already nearly completed the work of putting the old grade in order and is rapidly putting down the track. The iron is down for 18 miles south from Brainerd, Minn., and it is expected that the whole 54 miles to Watab will be ready for trains in October.

#### Western Union Telegraph.

At a meeting of the Executive Committee in New York, Sept. 12, the following statement was presented for the quarter ending Sept. 30:

Surplus July 1.....	\$75,085 78
Estimated net profits for current quarter.....	792,100 92
<b>Total.....</b>	<b>\$867,186 70</b>
Interest on bonded debt.....	\$112,000
Sinking fund.....	20,000
<b>Total.....</b>	<b>132,000 00</b>

Estimated surplus.....\$735,186 70

On this showing it was resolved to declare the usual quarterly dividend of 1 1/2 per cent., which will require \$525,925.50, leaving a surplus of \$209,261.20 for the quarter.

#### ANNUAL REPORTS.

##### Atlantic, Mississippi & Ohio.

This company owns the following lines:

	Miles.
Norfolk, Va., westward to Bristol.....	408
City Point Branch, Petersburg, Va., to City Point.....	10
Salt Works Branch, Glade Springs to Salt Works.....	10
<b>Total.....</b>	<b>428</b>

The present company was formed in 1870 by the consolidation of the Norfolk & Petersburg, the South Side and the Virginia & Tennessee companies. The road is now in the hands of receivers under a suit for foreclosure of the consolidated mortgage, and the following figures are from a statement made by them.

The earnings for the year ending June 30, 1877, were as follows:

<b>Passenger trains:</b>	
Passengers.....	\$380,040 63
Mail and express.....	105,750 17
Hire of equipment.....	5,729 78
<b>Total.....</b>	<b>\$491,520 58</b>

<b>Tonnage trains:</b>	
Tonnage transportation.....	\$1,289,495 70
Hire of equipment.....	6,859 62
Miscellaneous.....	14,464 58
<b>Total.....</b>	<b>1,310,760 90</b>

<b>Total earnings (\$4,210 per mile).....</b>	<b>\$1,802,281 48</b>
Expenses (73.38 per cent.).....	1,331,412 32

Net earnings (\$1,100 per mile).....\$470,869 16

The Receivers' report for the period of one year and 17 days from June 13, 1876, to June 30, 1877, receipts and disbursements as follows:

Receipts from all sources.....	\$2,009,123 59
Disbursements on all accounts.....	1,958,172 27

Balance on hand June 30, 1877.....\$50,931 32

The disbursements include \$1,087,066.99 for the maintenance of the property; \$222,872.88 for renewals, and \$21,502.45 for further construction. The Receivers report their assets and liabilities as follows:

Assets, June.....	\$226,641 12
Liabilities.....	294,813 54

Excess of liabilities.....\$68,172 42

These liabilities do not include \$176,209.36 interest due July 1 on the divisional bonds, that is the bonds of the old companies having prior liens to the consolidated bonds, and \$111,218.87 due on back pay-rolls, which would increase the liabilities to \$582,241.77. The assets, also, do not include \$884,500 divisional and consolidated bonds, of which \$441,000 are in possession of the Receivers and \$443,500 are placed as collateral security with parties holding Receivers' certificates.

##### Texas & Pacific.

At the close of the last fiscal year, May 31, 1877, this company's lines were as follows:

	Miles.
Main Line, Shreveport, La., to Fort Worth, Tex.....	219.69
Transcontinental Branch, Texarkana, Tex., to Sherman.....	155.12
Jefferson Branch, Marshall, Tex., to Texarkana Junction.....	69.05
<b>Total.....</b>	<b>443.86</b>

There are 36.94 miles of sidings. There were built during the year 26 miles from Eagle Ford to Fort Worth and 85 miles between Paris and Texarkana; the average worked for the year was 414.75 miles, against 325 miles the preceding year. The Main Line and Texarkana Branch are parallel, running nearly due east and west, and about 60 miles apart; the Jefferson Branch connects the two near their eastern end.

The road is equipped with 50 engines, of which two are used as stationary engines in the shops, and one is of 5 ft. 6 in. gauge and not in use; 14 first and 14 second-class passenger,

3 passenger and baggage and 11 baggage, mail and express cars; 494 box, 171 stock, 305 flat and 28 caboose cars; 1 directors', 1 wrecking, 1 pile-driving and 7 boarding cars. There were bought during the year 22 engines, 16 passenger and combination, 250 box, 100 stock, 100 flat, 5 caboose and 49 other cars.

The company has earned a land grant from the State of Texas of 4,816,545.39 acres, and has a claim to 135,360 acres more. Of these lands 3,148,756.39 acres have been located and deeded, including all the available farming and timber lands east of the Pecos River; the rest will probably be located between the Pecos and Rio Grande. Of the located lands, however, only 36,667 acres are immediately on the completed line. Some of the located lands contain valuable deposits of stone and coal, which will be reached by the extension of the road. The expenses of the Land Department for the year were \$35,589.41, chiefly for maps, certificate fees and other preparatory work. No sales from the land grant were made during the year, but \$16,137.67 were received from sales of donated and purchased land and town lots.

The general account (condensed) at the close of the year was as follows:

Stock (\$16,860 per mile).....	\$7,483,400 00
Bonds and scrip (\$42,191 per mile).....	18,726,866 38
Received from assets and town lot sales.....	260,823 35
Bills and accounts payable.....	816,929 57
Income account, surplus.....	318,985 02

**Total (\$62,202 per mile).....\$27,609,004 32**

Construction account (\$59,430 per mile).....	\$26,374,263 55
Land department, donations, etc.....	245,532 63
Property account, stock and bonds.....	275,600 00
Company's bonds on hand.....	394,000 00
Bills, accounts and balances due.....	100,763 04
Materials on hand.....	190,372 78
Cash in treasury.....	28,472 22
<b>Total.....</b>	<b>27,609,004 32</b>

The construction account includes all the cost of the survey of the 1,457 miles west of Fort Worth, and some work done at and near San Diego. The bonded debt consists of \$3,552,000 first mortgage 6 per cent. bonds; \$7,548,000 consolidated mortgage 6 per cent. bonds; \$7,339,805 income and land grant 7 per cent. bonds; \$192,970 State School fund loan; \$80,521.18 fractional bond scrip, and \$15,570 interest scrip.

Out of \$9,130,550.41 indebtedness of the California & Texas Construction Company, \$8,474,911.36 have been settled; there were sold \$3,216,000 first mortgage bonds at an average of 87.5 and \$7,443,000 consolidated bonds at an average of 80.1 per cent. of par value.

The work done for the year was as follows:

	1876-77.	1875-76.	Inc. or Dec.	P. c.
Train mileage, passenger.....	361,612	213,993	Inc.	147,619 69.0
Train mileage, freight and mixed.....	758,691	639,195	Inc.	119,496 18.7
Train mileage, working.....	211,030	91,895	Inc.	119,135 130.9
Train mileage, switching.....	113,877	65,071	Inc.	48,806 73.0

	1876-77.	1875-76.	Inc. or Dec.	P. c.
<b>Total.....</b>	<b>1,445,210</b>	<b>1,009,154</b>	<b>Inc.</b>	<b>435,556 43.1</b>
Passengers carried.....	220,103	182,080	Inc.	68,023 44.8
Passenger mileage.....	13,886,499	10,110,024	Inc.	3,776,475 37.3
Tons freight carried.....	355,789	254,288	Inc.	101,501 39.9
Tonnage mileage.....	43,369,881	28,006,762	Inc.	15,363,119 54.8
Av. pass. train load, No.....	38.40	47.34	Dec.	8.94 18.7
Av. freight-train load, tons.....	87.16	43.82	Inc.	43.34 30.4
Av. earn. per pass. train mile.....	\$1.5336	\$1.8482	Dec.	\$0.3146 17.0
Av. earn. per freight train mile.....	1.7007	1.6396	Inc.	0.0709 4.6
Av. expenses per mile, all trains.....	1.0959	0.9712	Inc.	0.1247 12.8
Av. net earn. per mile, all trains.....	0.5698	0.7327	Dec.	0.1729 23.6
Cost of engine service per mile.....	0.2283	0.2200	Inc.	0.0083 3.8

Of the passenger mileage 46.6 per cent. and of the tonnage mileage 72.1 per cent. was of local business. The principal items of freight last year were 230,133 bales cotton, 414,782 bushels grain, 20,304 tons flour and meal, 85,247 head of stock, 98,356 tons lumber, 71,007 tons manufactures and merchandise and 40,859 tons railroad material. The average passenger rate decreased 4.1 per cent.; the average rate per ton per mile also decreased 14.5 per cent.

The earnings for the year were as follows:

	1876-77.	1875-76.	Inc. or Dec.	P. c.
Passengers.....	\$524,195 47	\$397,426 82	Inc.	\$126,771 65 31.9
Freight.....	1,449,988 48	1,113,043 70	Inc.	336,944 78 30.3
Express.....	19,849 35	12,342 71	Inc.	7,506 64 61.0
Mail.....	31,035 00	30,574 90	Inc.	460 10 1.5
Telegraph, etc.....	18,382 00	11,236 85	Inc.	7,145 15 63.8
<b>Total.....</b>	<b>\$2,043,453 30</b>	<b>\$1,564,624 98</b>	<b>Inc.</b>	<b>\$478,828 32 30.6</b>
Working expenses.....	1,352,445 96	891,882 02	Inc.	460,563 94 51.6

<b>Net earnings.....</b>	<b>\$691,007 34</b>	<b>\$672,742 96</b>	<b>Inc.</b>	<b>\$18,264 38 2.7</b>
Gross earn. per mile.....	4,995 95	4,814 23	Inc.	181 72 3.8
Expenses per mile.....	3,260 87	2,744 25	Inc.	516 62 18.8
<b>Net earnings per mile.....</b>	<b>1,666 08</b>	<b>2,069 98</b>	<b>Dec.</b>	<b>403 90 19.5</b>
Per cent. of expa.....	66.18	57.00	Inc.	9.18 16.1

The gross earnings of the Jefferson and Southern divisions were \$1,727,432.64, or \$6,131.43 per mile; of the Transcontinental Division, \$315,920.66, or \$2,375.34 per mile. The latter suffered somewhat from a partial failure of the cotton crop on its line. The expenses were increased by the hurried manner in which the new road was built, and by the difficulty of getting labor, which forced the company to put the regular repair force on the new work and neglect repairs until late in the season. There were 223,626 new ties and a large amount of spikes, joints, etc., used in renewals. A large number of necessary buildings were put up, and many tools added to the Marshall shops.

The total cost of 111 miles of new road and the new equipment bought was \$1,781,793.16.

The income account (condensed) was as follows:

Balance May 31, 1876.....	\$338,523 17
Net earnings, as above.....	691,007 34
<b>Total.....</b>	<b>\$1,029,530 51</b>

Legal expenses.....	\$9,392 88
General office expenses.....	41,083 96
Insurance and taxes.....	64,806 76
Premium on gold and exchange.....	37,424 30
Interest on bonds.....	557,867 69
<b>Total.....</b>	<b>710,445 49</b>

Balance, May 31, 1877.....\$318,985 02

The report refers at some length to the plan for completing the 1,450 miles of road between Fort Worth and San Diego and for securing a Government guarantee of interest on the bonds. The report is accompanied by a map showing the entire line of the road, with its proposed branches and connection.

##### Chicago & Iowa.

This company owns a line from Aurora, Ill., west by north to Forreston on the Illinois Central, 80 miles, and it leases the Chicago, Rockford & Northern road, from Rockelle to Rockford, 23 miles, making 103 miles worked. A large part of its business is made up by the through freight from the Illinois Central's Iowa lines, which passes over this road on its way to Chicago.

The company recently defaulted on its coupons and the road is now in the hands of a receiver. The following statements for the year ending Dec. 31, 1876, are from a statement published by President Hinckley in answer to some questions put

to him by Mr. Joseph Rising, Supervisor of the town of Aurora, which has \$100,000 stock in the road.

The earnings for the year were as follows:

Local freight.....	\$160,976 12
Illinois Central through freight.....	365,868 14
Chicago, Dubuque & Minnesota through freight.....	1,474 60

<b>Total freight.....</b>	<b>\$528,318 86</b>
Passengers.....	140,811 65
Express.....	7,296 03
Miscellaneous.....	16,064 60

<b>Total (\$4,780 per mile).....</b>	<b>\$492,321 14</b>
Expenses (\$0.83 per cent.).....	299,493 18

<b>Net earnings (\$1,872 per mile).....</b>	<b>\$192,827 96</b>
Interest on bonds.....	\$140,000 00
Interest on Chl., Rockford & Northern bonds.....	20,000 00
Taxes.....	15,922 23
<b>Total.....</b>	<b>175,922 23</b>

Balance.....\$16,908 73

The bonded debt is \$1,750,000, bearing 8 per cent. interest.

President Hinckley says: "During the year additions have been made to the equipment by the purchase of 24 new coal cars, amounting to \$10,066.98. Also there has been \$12,390.22 paid for rails, in addition to the amount charged into repairs.

"There has been expended \$10,897.88 during the year in adjusting right of way claims, and depot grounds at Rockelle. Also \$10,043.16 has been expended for new fencing and buildings—showing a total expenditure for the year, over and above earnings, of \$30,284.27.

"This amount is carried into the accounts of the new year. Ten thousand dollars was borrowed to pay interest the first of January; the balance was in bills and accounts payable, which will be liquidated during the current year.

"There is included in the above statement, earnings of the Chicago, Rockford & Northern Railroad, the line from Rockelle to Rockford; both the earnings and expenses.

"It is proper further to state that we hope in the adjustment of the disputed percentage between the Chicago, Burlington & Quincy and Chicago & Iowa, to increase the earnings about \$10,000.

"By comparing the statement with the results for the year 1875, you will notice a large falling off of the earnings from the Illinois Central business, while there has been an increase of local freight earnings, and an increase of passenger earnings.

"I take this opportunity to say that, commencing with this year, there is a change in the price paid by the Illinois Central for hauling their cars from Forreston to Aurora, being a decrease of \$1 per car. This item alone will decrease our earnings about \$25,000 per year.

"It will be necessary during the year to expend every dollar that the road earns in repairs and improvements. It will be necessary to put in at least 75,000 new ties, and not less than 1,000 tons of new steel rails.

"There is another point which should not be lost sight of, and that is, that while we are running a large number of trains and are hauling a large number of cars over the line, yet a very large percentage, an average of 25,000 cars per year, are being hauled for the Illinois Central Railroad Company, and for which we now receive only \$5 per loaded car for hauling from Aurora or Forreston. It is a grave question in my mind, whether this pays the cost of doing the business."

##### Missouri Pacific.

This company owns and works the following lines:

	Miles.
Main Line, St. Louis to Kansas City.....	283.50
Carondelet Branch, Kirkwood to Carondelet (South St. Louis).....	15.50

**Total owned.....299.00**

Missouri River R. R., Kansas City, Mo., to Leavenworth, Kan.....	25.25
Leavenworth, Atchison & Northwestern, Leavenworth to Atchison.....	21.25
Ozark Valley & Southern Kansas, Bonville, Mo., to Tipton.....	25.00
Lexington & St. Louis, Sedalia, Mo., to Lexington.....	55.25

**Total leased.....126.75**

**Total worked.....425.75**

The road was sold Sept. 6, 1876, under foreclosure of the third mortgage and bought by the bondholders, who organized the present company, but did not acquire possession until April 30, 1877, owing to litigation by the stockholders of the old company, the Pacific of Missouri. The only report published for last year is by the Receivers, who held possession pending the foreclosure suit, and covers the period of the receivership, from March 8, 1876, to April 30, 1877, one year and 53 days.

The new company has no floating debt; its stock and bonds are as follows:

Stock (\$2,676 per mile owned).....	\$800,000
First mortgage main line, 6 per cent.....	\$7,000,000
First mortgage, Carondelet Branch, 6 per cent.....	500,000
Second mortgage, 7 per cent.....	2,650,000
Real estate (depot) mortgage, 8 per cent.....	800,000
St. Louis County loan, 7 per cent.....	700,000
Third and income mortgage, 7 per cent.....	4,000,000

**Total bonded debt (\$52,341 per mile).....15,650,000**

**Total (\$55,017 per mile).....\$16,450,000**

The annual interest charge is \$1,028,500, or \$3,439 per mile owned; the rental charges on the leased lines amount to about \$166,250.

The earnings for the period of 1 1/2 years from March 8, 1876, to April 30, 1877, were as follows:

Passengers.....	\$654,766
Freight.....	1,468,639
Express and mails.....	110,145
Rents and miscellaneous.....	30,222

**Total on lines owned (\$7,538 per mile).....\$2,283,772**

**Earnings on leased lines.....180,672**

**Total earnings (\$5,718 per mile).....\$2,464,444**

**Working expenses on lines owned (61.99 per cent.).....1,997,218**

**Working expenses on leased lines.....176,256**

**Total (\$4.63 per cent.).....\$1,873,474**

**Net earnings (\$2,018 per mile).....\$690,970**

The net earnings of the lines owned were \$856,554, or \$2,865 per mile. The results of the operations of the several leased lines were as follows:

	Gross earn.	Expenses.	Net or Deficit.	Rental
Missouri River.....	\$66,080	\$46,926	Net., \$19 163	\$80,163
Leav., Atch. & N. W.....	46,813	56,021	Def., 9,208	48,643
Ozage Valley & South.				
Kansas.....	14,909	17,688	Def., 2,780	5,110
Lex. & St. Louis.....	52,867	55,626	Def., 2,759	56,065